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PROCEEDINGS
OF THE
SEVENTH ANNUAL SESSION
OF THE
OHIO STATE EDUCATIONAL CONFERENCE

Keynote:
EXPERTNESS IN TEACHING

THURSDAY, FRIDAY, AND SATURDAY
APRIL 7, 8, AND 9, 1927

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Keynote: EXPERTNESS IN TEACHING

1927
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO

THE EIGHTH ANNUAL EDUCATIONAL CONFERENCE
OHIO STATE UNIVERSITY
APRIL 12, 13, AND 14, 1928
Keynote: TEACHING AS A FINE ART

GREETING

THE CALL for teachers of skill continues to be heard. It is as insistent in Ohio as it is elsewhere, and the multiplication of higher educational institutions has apparently augmented the appreciation and the demand. Our State School Commissioners have, through the years, stressed the need of more and better training for teachers. Barney in the middle of the last century observed that "the best interests of our children call for the employment of gifted, skillful, carefully trained, efficient, devoted teachers" who "should know how to remove prejudice, conciliate esteem, and excite attention; should be able to soothe or arouse; and should be so well acquainted with the faculties and powers which they are to educate, develop, and brace with proper discipline, as to be able to touch the right spring, with the right pressure at the right time." That is the substance of all that can be said today about this matter.

Twenty years later Smart deplored the lack of centers of teacher training in Ohio, saying that "Normal colleges are as necessary as medical colleges. The injury to the mind of a child caused by the stupidity of an ignorant teacher may not be as apparent but it is just as real as the maiming of the body by the unskillful use of a surgical instrument."

The same sentiment finds expression by Harvey, Burns, Hancock, Corson, Bonebrake, and others, and in 1909, Zeller tells us that public-school men and appreciative friends of education "are of one mind upon the fact that the teacher is the most vital force, the most effective agency in the improvement of the schools. They realize the fact that fine and costly schoolhouses with all the modern equipments count for something, but that well-prepared, well-trained, cultured, skillful teachers count for vastly more than all these."

Today in Ohio, with four normal schools of state-wide support and a college of education and other local normal schools, we are still emphasizing the "skills" in teaching—skill in imparting knowledge, skill in provoking thought and encouraging expression, skill in reading the mind and purpose of the pupil, skill in stimulating activities and in encouraging tendencies. All this presupposes a comprehensive knowledge by the teacher of the subject under discussion, the ability to state analogies and portray contrasts and to relate the subject to other known subjects; the ability also to use the proper tools, whether they be books, physical materials, or laboratory apparatus, and all at exactly the right juncture and in such manner as not to arrest the stream of thought or distort the mental picture being created.

Teaching thus is soul-effusing, life-consuming for the teacher, and thrilling, absorbing, and life-creating for the learner. The greatest teachers, like Pestalozzi, have cherished skill and expertness in dealing with the subject and also have been kindled with the fervor of emotion stirred by the great enterprise of enriching life and developing personality; they have made a consecration of talents and energies to the development in youth of purpose and zeal and accomplishment.

The College of Education is presenting a program for this Seventh Ohio Educational Conference which grows out of the conviction that skill or expertness on the part of the teacher should now become the focal point of thought and discussion, and, further, that a distinct contribution can be made here at this session to a determination of the elements required to produce this quality.

The University extends cordial greetings to the teachers of Ohio, welcomes those who come for our benefit and pleasure from other states, and desires the happiness and satisfaction of all who honor the University by their attendance.

George W. Rightmire
President

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GENERAL SESSIONS

GENERAL PROGRAM

THURSDAY, APRIL 7

WHAT MOST EDUCATES

RANDALL J. CONDON
Superintendent of Schools, Cincinnati

I did not know that I had to talk on the subject, "What Most Educates," when I accepted a place on the program. I was told two or three months ago that the subject of this meeting would be "Expertness in Teaching," and that my colleague on the program would be Dr. Thorndike. I said that would work very well, because he would talk about the theory and I would talk about its application. Then when I was in the midst of building a program for the Dallas convention, the chairman of this Conference asked me, "What is your subject? We shall have to have some subject announced on the program with your name." I said, "I do not know. I am going to talk at Dallas on the 'Qualities of a Great Teacher.' How would that do?" He said, "I don't want any second-hand stuff." I said, "If you must have another title, use the one that is announced on your program, but it will be the same speech."

A reporter came into the office the other day and said, "What is your speech at Columbus?" And I said, "It is printed on the program, 'What Most Educates.' " "What is it?" she asked, and I replied, "I wish I knew."

Another reporter came in a day or two later and said, "Tell me, what are you going to say?" I knew he was a reporter that could not be put off, so I talked to him for five minutes on what I was going to say. He said, "Well, I'm going to the Conference, and I shall look over the local papers to see if you have said what you just now told me." I do not believe I shall.

I told him that this speech would be the same story that I have been telling for forty years. I have no new contribution to make. If anything, it will be just a brief summary of what I have thought education to be all these years, with a new phrase or two thrown in here and there to emphasize the thought that education separated from life is not education. It is only when we connect it with life, when we get down to the heart of a child and a teacher and so present the things that we are trying to teach that they awaken an inner response and an inner acceptance—only then does education take place.

I did say to the reporter—and I suppose I had better report this much, for he may print it and hold me guilty if I do not—that I should start out by saying that the subject "Expertness in Teaching" is not that which educates. Now, I do not mean, Dean Arps, to take issue with your program or your topic. It is a good topic and conceived in the spirit in which this program is arranged, I agree with it. Yet I want to add that he we speak of the term "expert," we are inclined to think of cleverness, smartness, knowledge. If knowledge alone is the equipment of the teacher, her teaching will never educate, for it is only as she does and as she herself becomes in her relationship to her pupils that education takes place.

I am thinking of education now not alone for the children who come into the schoolrooms, but of the teachers themselves, for this Conference in itself is that which most helps to educate the teachers of Ohio to a right conception of what teaching is. It is important. How shall this obligation be discharged? How shall we address ourselves somehow to our work of directing education and teaching children, little or big, in such a way that education shall take place in them?

I used to think that Calvin Stowe was about the first man that talked expertness in teaching or training of teachers for their work. I gave Ohio the credit for having recognized through its State Legislature that they ought to send a man abroad, at least pay his expenses, to find out how education took place. Stowe went abroad in 1835 and came back and made that report to the Legislature that was later reflected in the School Laws of Massachusetts and New

York and Pennsylvania. He laid down as one of the most fundamental rules of education in Ohio that the training of teachers should be the thing of greatest concern. He said something which we have hardly approached yet—or which we have just begun to approach—that three years of professional training was the minimum which ought to be required for preparing teachers for their important work. He believed that they could learn their work as teachers not from the lectures of the professors nor from textbooks, but from applying these teachings themselves. He said that the last year of the preparation of a teacher should be part-time work in the classroom in which theory was related to practice. Since teaching was for the children, it must be worked out in cooperation with them if the teacher was to be well prepared.

A year or two ago I ran across a statement that goes back two hundred years before Calvin Stowe. It was written in Massachusetts, not by Horace Mann but by John Elliot, the apostle to the Indians. He wrote:

> Advice also is given for the settling of schools. Every child capable of learning (he recognized even then that it might be some mentally defective institutional case) should be taught, whether he makes use of it or not. Yet if any should sinfully neglect schooling in their youth, it is a transgression liable to both orders, civil and ecclesiastical, the offence being against both.

I like the sentence with which he closes:

> Education should be open to all, and all should be required to receive it if they are capable, and that it was not for those to pay for it whose children were directly benefited, but that it should be a common assessment upon all, whether or not they have children to be educated.

After he stated this principle of compulsory education, he said, "So we walk in Natick." So we walk in Ohio, so we walk in Columbus. Education of all the children based upon the taxation of the property of all the people, an equal opportunity for all to receive as much of education, to go as far as their capacity and their inclination shall send them.

John Elliot said another thing:

> And seeing they must have teachers amongst them, they must also be taught to be teachers, for which cause I have begun to teach them the art of teaching, and I find some of them very capable, and while I live my purpose is to make it one of my chief cares to teach them some of the liberal arts and sciences and the way to analyze and to

> lay out into particulars, both the works and the word of God, and how to communicate knowledge to others methodically and skilfully, especially in methods of divinity.

Therefore, in 1636, or thereabouts, John Elliot laid down as the principles of the professional training of teachers that they should know how to impart knowledge. But if knowledge is the only thing that is imparted, it may be of little value, for it may have little educational significance for those who receive that knowledge.

Some two or three years ago while riding across the vast stretches of Arizona, I wrote to a friend in the East. I had, as I thought at that time, put into the phrasing of the letter some of the things which make education significant:

> I have just been visiting schools, and I have seen two kinds, the static and the dynamic. I have found that the cities in which these two types of schools are located may be characterized similarly. In two of the cities that I have just visited the schools came under the first group, and in two other cities they came under the second. In one everything is formal and lifeless, deadening the emotions and weakening the will. In the other all the activities of the school are filled with life and animation, with a spirit of investigation and of creation. I wonder what education will mean for those children who come out from the first, for I know that their education will largely be determined by the character of the schools. Out of the other school I am sure the children will come with an awakened spirit, filled with animation, responsive to life, eager for the finest things, with an appreciation of beauty and of all the things that go to make up a rich life.
>
> In one school they are interpreting the things of the past simply as things of the past while in the other they are interpreting the things of the past in terms of the living present. They are making the young people who are receiving their instruction responsive to living conditions, eager to understand the life they are now living and reaching forward to a richer, finer life in the future.

In Second Timothy there is the significant expression, "ever learning, but never able to come to the knowledge of the truth." I think the reason that so much of our teaching is fruitless is because the child is not taught to understand the truth, its significance, its relation to his life and to his spirit, to his present and to his future. It is fruitless because many teachers have not comprehended the truth of that which they are trying to present.

Several years ago I traveled ten thousand miles in about five weeks visiting schools. My purpose was to discover, if possible, what constitutes the living thing in education and how we should know it when we see it. I visited every kind of educational institution from country schools to universities: night schools, schools for adults, rural schools, and city schools. I visited all kinds of classes—music and literature and foreign languages and mathematics and technical subjects. I discovered running through them all a line which separated them into two groups. It was not the subject-matter nor the particular thing which was being taught, but the spirit in which it was being presented.

This was characteristic of the teaching that seemed to be vital and purposeful; the teaching was not for the thing itself, but along with it was the application, the usefulness of the thing. It was being presented in its significance to the children, and its larger significance to the community as a whole. I think if our teaching is ever to bring us to a knowledge of the truth, it must find its application, not merely in the life of the schoolroom but in life outside of the schoolroom.

I sometimes wonder what it means to the children every day as they come to school and spend the five hours with us and then go away. I wonder what it means to the fifty thousand children of Cincinnati who come to school at 9 o'clock in the morning, and then at half past two or three go home along the streets of the city. As the children go to their homes, I wonder if their lives are any richer than they were when they came. I think that must be our test. If we are serving a useful purpose, we decide that every day shall be significant to these children, and that it shall mean a richer life for them in terms of education, because they and we together have tried to interpret life and to enkindle their spirits. I think the finest word that was spoken in the program at Dallas was by the oldest speaker on the program, Dr. James L. Hughes, of Toronto, when he said, "There is only one word, to 'kindle,' to awaken."

I wonder when we look over our lives, as we look back to our childhood in memory, what it has been that meant most for us in terms of education. I am sure it was not the particular things that we learned in school, though they were necessary, and I would not disparage them in the least. But some day there came to us, when we were least expecting it, some great enlightening vision, some word that the teacher spoke, some word which came from outside the school which helped us to understand that which was being given to us in the school.

A year ago I asked five hundred men and women in America what it was in their childhood that had the greatest significance for them in education, and whether they learned these things in school or out. You might be astonished if I said that there were not more than a dozen who said that what they had learned in the school came back to them now as having had a great influence on them. Many of them were generous enough to say that they believed that the total result of the school education was very significant and worth while. The big outstanding things which had touched them were found in the library, in the community, in the home. It was by some older person, man or woman, as they walked along the ways, that the thing was dropped which, as they look back at it now, helped to shape their lives. Those who said it was in the school were outstanding cases; they had come in contact with some great teacher, and their lives were kindled. They looked back to that teacher and his influence on them with the greatest appreciation.

I had a letter last year from a girl who said, "I am a student at P— College writing a thesis on the topic 'Learning Goes Forward More Easily with an Activity Program.' If you will write for me a statement that you believe this principle is true which I may incorporate with my thesis, I shall greatly appreciate it." Sometimes it seems to me that most of the young people in college are getting people outside of the college to tell them what they are to put in their theses. Sometimes it seems as if professors of education are so busy accumulating material to put into books that they do not have time to look after the education of their students—that is not said in any unkind spirit.

I got a letter the other day from a young girl in South Dakota who wrote: "We are directed by our teacher to write to five persons and to obtain a reply from each one of them," and then she went on in a long letter to ask, "Why did you select teaching as your profession? What have you found in it of satisfaction? Why would you advise anybody else to enter it?" I said, "My dear girl, I am awfully sorry, but I just have not the time to tell you. Just go on and become a teacher if you have the qualities and the desires, and then you will learn for yourself."

To the young woman at P— College who said that learning goes forward more easily with an activity program I wrote:

> I believe your statement is correct. I would almost be willing to say that learning does not go forward at all without well-organized activity [I did not say activity program but without a well-organized activity]. You can well afford to put the word "effectively" after "easily." I believe that it is much more important than "easily," and that learning goes forward more effectively with activity.
>
> Froebel, Pestalozzi, and a host of others have been trying to teach this truth, but we have been slow to learn. I suspect the reason that we have not learned it is, because we have not followed an activity program. I believe, if we ourselves are active, if we are learning, that our program of activity will educate us. When you and I, as teachers, cease to learn then we are no longer in a position to teach. For only as we are alive and developing and growing ourselves, shall we bring a vital message to the children that will enable them to become educated.

Then I added this as the closing sentence, "You cannot learn much unless you do something." Education will become significant as we apply it, as we do something. Our teaching will not be barren then. The children shall be alive, because they have something to do.

I received a program or circular of the Locarno World's Conference of New Education. The first words which caught my attention were "the true manner of freedom in education." Then I turned to see what it was, and it seemed to me to be rather significant. I do not believe there is any new education or any newer education. The nature of humanity has not changed much, and the things which helped people to learn in the past will help them to learn now.

Here is what the circular said, "The true meaning of freedom in education will be the general theme of the conference. The world is clamoring for freedom. Teachers need to study the true way of freedom, which comes not from unrestraint, but from the right inner control." The circular was worth the time it would take to read it if only for the words "not from unrestraint, but from right inner control." For our education must build up in the minds and hearts of the children the ability to control themselves, the ability to direct their activity in a way that will make for their welfare, happiness, growth, and development. It must be our aim to discover the principles and the art of freedom, both for the children and for the teachers. There can be no freedom for the children unless there is freedom for the teachers. Teachers must be free to express themselves. They must have the joy and the opportunity for creative work. Things will mean something for the children if growing out of the desire for constructive creative work on the part of the teacher, there comes constructive creative work for the children.

Someone told me today that the young people who went out in some of the institutions of learning came back after three or four years, and they seemed to have lost all their hope and their enthusiasm. When they were asked the reason they said, "Why, if we ever made a suggestion, we were frowned upon. We were never allowed to work out our own thoughts, our purposes." And I said, "I rejoice that I am in a city where every teacher is given an opportunity to express himself." And as they come to us at headquarters and say, "What do you think about this?" our answer is always, "Go ahead and try it. If it is not right, you will find it out, and if it is right it will be of great value to you and to the rest of us, too." I think more and more teachers everywhere are being given this freedom of expression, this opportunity to create, but it must not be unrestrained and meaningless, it must have right inner control for teachers and pupils.

If they can find out at Locarno what that is and how it comes to pass, they will be doing as big a thing as they did when they settled the conflict between Germany and France. For the peace of the world is not dependent upon the settling of the war debts nor the laying down of arms between Germany and France, the peace of the world comes from the right development of children so that when they grow to manhood they will have the attitude toward life which makes warfare and strife among men impossible. For unless there is developed that inner unity, that inner responsibility, and that inner control, there will never be peace in the world.

One of our directors told me the other day of a great pleasure which had come to him recently. The young people of one of the churches in the neighborhood where he taught years ago asked him to make an address. He told them that he did not believe they would want him and suggested that they get a better speaker than he. They replied that they wanted him because when they were in the eighth grade he had been the teacher and he had meant more to them than any teacher they had ever had.

I do not believe that unless we as teachers are bringing happiness to the children that our education will be very significant for them. Creative education, I think, is going to be the new slogan. We have worn most of the others threadbare, but creative education will never wear out.

What kind of education is creative education? It is that which springs from within, which is free, which reaches out. It will be characterized by art and loveliness and beauty. It will be that which creates beautiful things in a spirit of joy. Our education will fail of its greatest significance unless we are thinking not of our ourselves but of others, with a desire to contribute to others in human welfare and human service.

Dr. Winship says that down in Revere, Massachusetts—I am not quite sure that he is correct about this, but if he is it ought to be remedied—there stands the only public school in America which is named for Louis Pasteur. When he visited that school for the first time, he said to the superintendent of schools that it must have been named by a physician. The latter replied that it was named by a letter carrier who was chairman of the school board. Later this letter carrier told us that when he was a schoolboy in Bangor, Maine, a local physician gave a lecture to the school on Pasteur. He was so fascinated by it that he planned then to get on a school board sometime and name a school for his hero. It took him fifty years to do it, but he did it. The influence of that physician's talk about Pasteur stayed with him, influenced his reading, his thinking, and ultimately his action. I do not suppose that physician thought of himself as a teacher, but he was so fired with his appreciation of Pasteur that he inspired others. The fire from his soul touched a boy, who fifty years afterwards as chairman of the board of education gave the name to the school, hoping that name would inspire other children as he had been inspired.

Since the Dallas convention, I have had many letters from superintendents and heads of departments of education, and I have appreciated them. But I have had two letters which have brought me more joy than any of the others, for they were from high-school pupils who were members of that great national high-school orchestra. One of them came from Idaho and it was written by a girl who said:

> As a member of the National High-School Orchestra of 1927, I want to tell you how much I enjoyed playing before you and the pleasure I got from my entire stay in Dallas. Of course the Thursday night concert was the climax of the week, but next to that came the vesper service Sunday. . . . The whole time was packed so full of thrills that I could not pick out the biggest one. It was one of the most wonderful weeks of my life, and I want to thank you for making it possible.

The second letter was written by a boy in Maryville, Missouri. He said: "I learned more about music in the one week I was there than I ever dreamed was to be known. It was the most wonderful experience of my life, and I doubt if I will ever have anything that will equal it." Those 266 high-school boys and girls from 39 states received more clean education during the week they were in Dallas playing together, than could possibly have been given them in their schools if they had stayed at home.

I saw a letter received by a teacher at Christmas time which said:

> I have wanted to thank you for the lovely things you have done for me and somehow I cannot. Yet I like to think of you as one of the loveliest gifts which has ever come to me to make me happier, but you are a gift for which I can give no return except my constant love and interest.

I wonder if a teacher ever received a lovelier gift at Christmas time than that.

I said to a little girl some time ago, knowing that she had a new teacher, "How do you like your new teacher?" She said, "He is great. He is so kind. If you do anything good, he tells you so. If you don't, he doesn't say so. He just sits down beside you and shows you how to do it. And he doesn't leave you until you know how." I wonder if all the children are judging us that way? That we are great, that we are kind, that if they do anything good, we tell them so, and if they do not we sit down beside them.

I remember as a boy back in the little country school in Maine when a teacher came and sat down beside me and taught me long division. I had been struggling along with it for a week or two. I had been trying to make it look like the work the other boys had on their slates—we did not have tablets then. This teacher came and sat down beside me opened up the whole subject and made it all clear. Pestalozzi has said, "The end of instruction is making ideas clear."

I had a letter recently which recalled an expression that I had used in one of my classes many years ago. The writer said: "I have always remembered the advice given by Mr. Condon, 'Start out in life to build a castle. You may end up by building a woodshed, but the more you add to your castle lumber, the more you will have left for your woodshed.' " For forty years that homely expression had stood by this man—I had forgotten it.

I want to tell you that one of the delightful things which comes to a superintendent is to have the teachers share with him some of their pleasant experiences. One teacher told me recently of such a happening: her class from the vocational school was on its way to the Home Beautiful Exposition. As the group paused to let traffic pass, a blind man tapping his cane happened along. He strayed from his path in the crowd and was in imminent danger of colliding with a telephone pole. Quickly, as quickly as it takes to tell it, one of the girls stepped forward, took his arm, said a few kind words, and led him across the street. When the class assembled, and had discussed the wonders of electricity as applied to houses, one girl said, "Don't you think Mildred should be given a mark in ethics for helping the blind man?" The teacher asked the opinion of the class and they voted to give Mildred 100 marks for conduct, for kindness. We in Cincinnati give the same mark in conduct that we do in arithmetic, for we realize that conduct is even more important than arithmetic.

Some time ago when this teacher was urging her pupils to look for the beautiful in everyday life, a little girl came up to her and said, "I am so sorry, but I could not do it yesterday." "Do what?" "Oh, you know, what you were telling us the other day, to see something beautiful every day. Well, I had until Saturday. It was raining, and I was helping mother in the kitchen. I looked out on the sooty roofs and thought, 'I won't find anything lovely today,' but in the afternoon I was minding the baby, and the sun came out and touched the baby's head and made her hair all golden. Oh, it was beautiful."

If as teachers, we can put into the hearts of children the desire to seek for beauty and to find it in the gold of the baby's head touched by the sunlight, the beauty of the stars, the fields, the singing birds, then whatever we try to do will be significant for the children, and education will be worth while. That is the only kind of education that is of great value, that most educates.

SOME RECOLLECTIONS OF A COUNTRY EDITOR

William Allen White
Editor, Emporia Daily and Weekly Gazette

I am uncertain exactly how to approach the subject of education through a newspaper experience, and yet I suppose we editors and you teachers are all at work on the same job. The recollections of a country editor which I shall give have no importance merely because they are mine. As mine they are trivial and unimportant, but as they typify something that has happened to America in the generations since I began they may be significant—significant even to a teachers' conference—as pointing the way to a great change that has come over our country in this generation.

It is a marvelous change, and it goes, not only through our country here, but practically all over Christendom; for to a more or less great extent, the thing that happened to America has happened all over the western world. I saw as I came in today the beautiful white shaft rising here—a commercial building—and its beauty brought tears to my eyes. It was lovely beyond words, yet something of the same shaft, of the same kind of architecture I have seen in every great city that I have visited. We are standardizing even beauty, which is good. But we are standardizing other things which are commonplace, and perhaps other things that are not so good. I have run in the *Gazette* at Emporia, for more than thirty years, incitements to the populace always to vote for bonds, mostly school bonds. I never have missed a bond issue of any sort, from purely selfish motives. More schools, more high schools; more high schools, more high-school graduates; more high-school graduates, more readers of the *Gazette;* more readers of the *Gazette,* more money for its editor.

Now, something of that sort has been happening, as I say, all over Western civilization, from the Caspian Sea to Honolulu—education of one sort or another—standardizing civilization. My little town of Emporia, a town of twelve thousand or so—the Chamber of Commerce figures fifteen thousand actually—is merely a cross-section of American life. There is no difference between Columbus and Emporia, except that there are more twelve thousands here than there are there. They are practically the same twelve thousand over and over again. Wherever we go in this civilization of ours, particularly in this American civilization, it is one and indivisible.

I remember thinking I would get a new thrill if I crossed the ocean to the Hawaiian Islands. Honolulu looked like Kansas City, and not unlike Columbus and not unlike other large American cities. There I saw beautiful skyscraping architecture, the same schools, and the same stores. Then I took a boat to the remote island of Hilo. There as I stood on the deck of the boat as it came into the little harbor, I saw the points of the great volcano with its plumes in the blue of the sky, a new and beautiful sight. And I went ashore and down a little street that was a commercial street of Emporia in replica. I remained there until the next day, the Fourth of July, and there I saw the procession such as it was, and as I had seen it rolling down Commercial Street, these thirty years and more. The only difference between Hilo and Emporia was that every man jack in the parade at Hilo was colored. They were what Kipling called "the yellow, the brown, and the black."

They held high what we have in Kansas, and you have in Ohio, and what they have in California—pride of birth—and carried a great lovely banner, "the yellow and brown and black," behind the silver cornet band of Hilo, preceded by the red carriage of the Fire Department with the men in helmets. Back of the Fire Department and the band came a procession of all the colors of the racial rainbow, excepting polka dot, carrying a banner "Native sons of Hilo, 100 percent American." I fancy if I could have gone into those Fords and second-hand Buicks and given the grand hailing sign of the Ku Klux Klan, I would have got plenty of response.

It was the triumph of standardization. The Hilo evening paper carried the same Associated Press news that the *Emporia Gazette* carried that evening, and I noticed that the J. C. Penney Company over there was carrying exactly the same display advertising of a special sale of ladies' underwear that they carried in Emporia, and the yellow, the brown, and the black were wearing the same, just the same kind.

How did this happen? I can tell you somewhat by reciting as I say these recollection of a country editor who just happens to be I, not because they are anything unique. There is nothing glamorous or peculiar about me! I am just a typical country editor from Kansas, and just like the country editors of Ohio and of the rest of the country. But my story will illustrate to you what has happened in America since the Civil War.

My first introduction to a printing office was in the late seventies when I was a little boy ten or eleven years old. My father was an old-fashioned doctor who believed that Satan found evil things for idle hands to do, so he took me by the hand and lead me to the printing office and told me to go to work for the editor. The editor that day had his shop in a little one-room shack just halfway between the sunflowers that bordered the road on the west from Kansas clear to Pike's Peak, and on the east the row of one-storied saloons, general stores, and one thing or another that stretched down to the creek and on back to civilization.

In the little one-story shack was a Washington hand press and two racks of type. On the walls were posted the handbills and the various examples of the job-printing art of the two printers who were employed by the editor. The editor himself wrote at a home-made desk, beside which stood a large box of sawdust into which he copiously and fluently spat as his thoughts stirred inside him.

Such was the outfit which ran what in that day was a typical country newspaper throughout the United States. In some places it was a little larger; in other places, a little more primitive even than that. I worked there until the end of the week; the editor walked off without paying me. I spoke to my mother about it. She said, "Well, you haven't worked there quite a week yet. When your week is up, he will pay you." I worked until my week was up; he said nothing about paying me, but he sent me out for a bucket of water across the lot. It was June. Of course school was out. About that time, the gang came moseying along the alley and made ribald and indecent remarks at me as to one who was in bondage. They stayed a little while and threw some clods at the wasps and went on down among the woods yelling improper and unhappy remarks. I looked at them and thought I had worked for a long week and that the laborer was worthy of his hire. Well—so I went after them and did not go back.

When I was graduated from the town high school six or seven years later, I went off to a little fresh-water college and my mother ran a boarding house to keep me. I thought that was no decent thing for a boy to have his mother run a boarding house to keep him, so I wrote three letters, one to a grocery man, one to a dry-goods merchant, and one to the same country editor, and asked them for a job, a summer job. I thought I would stay and work until I got enough money to take me through the next year's school. Of course the grocery-store man was a man of honor. He would have taken me and paid me. The dry-goods store man also had a certain sense of social obligation. But the editor was a Democrat in a Republican state—a sad and lonely man. He sent for me, and said, "Come on." And I went back. As I came into the office, he said, "Well, Willie, you had better go down and bring back that bucket of water."

Whereupon I started in my career, my real career as a printer. There had been some improvements in the office of the editor; he had moved upstairs, the room was plastered, and the handbills for the Fourth of July had a little color in them, red, white, and blue. They had three printers instead of two. The editor—remember that was in 1885—had political aspirations. The Democrats had elected Grover Cleveland as their president, and so the editor had bought a plug hat and wore a white shirt on Sundays. The wheels of industry had slowly begun to turn in the newspaper business. I had to learn the printing business, but being a high-school graduate with a year in college, I learned everything that I could learn in nine or ten months—a year or a little less.

Then I returned to the town where the little college was located. I walked up to the foreman of the composing room on the third floor and said that I was going to school and would like to have a job as a "sub." That was the title they used in the late eighties for a part-time employee. I got the job. I told the foreman a pure lie that I was a four-year apprentice. I pulled out like a four-year apprentice and made good pragmatically if not ethically! So I made enough money to go to school.

I was rooming with a man who went to the same college, another printer, who had got a job as a reporter downstairs in the reportorial office on the first floor. He was the college orator of the little college—and in those days an orator amounted to something. He was almost as important as a football man is now. He used to come in at night and yank all the clothing off me and recite his oration. I coached him. When he went up to the state oratorical contest he took a trainload of students with him, and I was given his job as subreporter and walked out of the composing room into the local room on the first floor. There were two other reporters and a boss and a business manager, and that was all. The economic status of the newspaper was beginning to broaden.

Well, this young man went to the state oratorical contest and walked out on the platform. He was a handsome pup with a fine cluster of black hair above a high noble brow, long Prince Albert coat, black tie, and olive complexion. He walked out on the platform, threw out his hands, and began the first startling sentence of his oration. Mind you, I was back in town holding down his job as subreporter. He thought it was a pretty good sentence, said it again, stopped, moistened his lips, then a glassy, curiously fish-like stare overcast him. He stood and stood and stood and finally walked off the stage too ashamed to come back to the college. That is how I got my first job as a reporter.

There was no division of labor then. I did all sorts of things. I wrote articles, I talked to the advertisers, and I did every conceivable thing about the paper as far as the writing end was concerned. I went up to Lawrence, Kansas, to the State University and did the same thing on a little larger paper.

Finally, I got a job on the *Kansas City Star* as an editorial writer when I was twenty-two years old. I was one of these foolish "boy wonders." There was a real big newspaper with division of labor, and in a building all its own. During the fourteen or sixteen years since I had walked into the first little newspaper office housed in an unplastered and unpainted one-room shack in a little town, the world's wheels of industry had been moving. Here was an eight-page paper which employed two or three editorial writers. The editor and owner, Colonel William R. Nelson, was a man of talent and ability. There were five or six or perhaps ten reporters down in the editorial office; a dozen men in the business office solicited all kinds of advertising; there was the subscription department; and back of the big room was row after row and rack after rack of type. We boys heard one day that the boss had been offered one million dollars for his paper, and we did not believe there was that much money in the world. That was in 1894.

By 1895, I had become a fast talker so I talked three men into lending me a thousand dollars apiece unbeknownst to each other, and went out and bought the *Emporia Gazette*. I can yet see the office as I walked into it. Nearly all the machinery was in one room. There it was—all mine—in a little room not as big as this platform. I employed one reporter and a bookkeeper. My total payroll the first week loomed like the national debt. It was $50. I paid the printer a dollar a day, the foreman $12 a week, the reporter $6, and the bookkeeper $8.

We had a rotary press, an old Cottrell press, which printed from the type and threw the papers down on a table. The carriers came in and folded the papers as they were run off. I remember standing at the foot of the press looking with pride of possession as they came off for the first number. It was a little daily in a little town. The town then was ten thousand. In thirty odd years they have added two thousand. Pretty good growth, I think.

We had at that time 485 subscribers, and my pride was beyond all bounds. This little rotary Cottrell press could have been bought second hand for $600 or $700. There was five or six hundred dollars worth of type and material. Perhaps there was $1500 worth of physical plant. The leading advertiser was a dry-goods dealer, and his total bill for the month was less than $25. A hardware man paid me, I remember, $18, but I had to take it in trade. I paid the first week's payroll out of the political announcements for the county convention. The second week's payroll I covered by gathering some notes that were past due. How I got through the summer Heaven only knows, but I went into red a little at the bank. Finally, as the years rolled on I could say I was not very badly off. Working on the *Star,* I could remember two or three months that had five Saturdays in them, but, when I was on the other side of the payroll, every month had five Saturdays, and some six and seven.

I am not telling you this merely to be relating to you an uneventful story of a drab life, but to illustrate something as you will see. Mind you here is the town and the county. There were twenty-six thousand people in the county when I came there; there are now something like twenty-five thousand. The town has twelve or thirteen thousand, according as you believe me or the Chamber of Commerce, and it had nine or ten when I came there. But something has happened to that town and community, and that something is what has happened to civilization, and particularly to American civilization.

Within two or three years I got a few more subscribers. I ran it up to six hundred. I do not know how, but I did and put on a couple more girl printers. We hired girl printers at $4 a week. Along in the early part of this century, 1901 or 1902, a salesman who was a faster talker than I came along and sold me a linotype. I did not have any more money to buy a linotype than to buy the moon. But he gave me the linotype on time and "terms," and I took it as though I had to pay for nothing else. That was to reduce the payroll. He promised me that this linotype would do the work of seven girls, which it did, but I soon found the payroll had grown under the linotype and was wandering around $200.

The dry-goods man was paying me $75 a month. The subscription list was up a little, and the payroll kept going up. Work came in, advertising increased. Two or three years later I bought another linotype, having paid for the first one, then the payroll jumped to about $500. I was always about four laps ahead of that payroll with those linotypes, thinking as I bought each new one that I could reduce the payroll.

With it came increases in the advertising and the subscriptions. Now, there was no reason why the subscriptions should increase. We were not giving them a much better paper, but more people were taking the paper. More people were reading, and the advertiser was reaching out after those people. The circulation went up from a thousand to twelve hundred to fifteen hundred. We bought a third linotype, and then we had two thousand subscribers. Then one day we put in a new press, a press that cost $7,000, a rotary press that printed six thousand papers an hour. I only had two thousand circulation. When I wanted to see the paper run, I went downstairs, because it was in the basement.

Then along about 1912 we ran past three thousand. Now, remember the town was the same town. A second dry-goods store had come in, and a third. They were paying us $200 or $300 a month, and other advertisers were charged in proportion. The payroll was following to around $700 or $800 a week. A distinctly new line of advertising had come in—the automobile! The people were buying more and more. Now, this was not just Emporia. It was civilization. The thing that was happening to me was civilization.

About 1915 we added our fifth linotype, and within a year or so later we bought an advertisement-setting machine called a Ludlow and the paper ran past four thousand subscribers. The Newman Dry Goods Store, which when I came there, used to pay me in terms of $20 or $25, had begun paying me in terms of $300 or $400. I was able to let the hardware man pay cash. And he began adding paint and tires. The automobile advertising was crowding the dry-goods advertising in the amount of space used.

A generation ago, the big item of advertising income was dry goods. Now, moving pictures and automobiles are better than dry goods, while the radio is running a good close third. What is happening? The people are buying—buying things. We have not any more people in town practically than we had. Every house in town today is connected with a telephone; every house in town today has electric lights and gas, and a thousand little comforts and luxuries which in another age were unknown. They were buying more and more things. The community was changing, and the newspaper—the American newspaper to a greater extent than any other newspaper in the world—was creating a demand through advertising, civilizing these people.

We were giving them a little better paper. We put in the leased wire of the Associated Press a few years ago. And year before last, when the circulation jumped to five thousand, we put in a press that prints thirty thousand an hour, and I have to stand there when we start to print it now. I cannot even go downstairs if I see it go.

The equipment of the *Gazette* when I bought it was worth about $1500. Now, I have between $75,000 and $100,000 in it. And the *Gazette* is not different from the papers in any Kansas town of the same size, or in any town of the same size throughout the country. All because the newspapers are creating a demand for things. Advertising has been one of the agencies which has worked toward an economic distribution of goods.

I am not afraid of the soap-box orator. I am not afraid of the Red. I am not afraid of the Communist. He cannot make a "divide" of things. The real people who are distributing the goods of this world, particularly on this American continent, the real power in economic distribution is the advertising end of the newspaper which creates an economic discontent in the heart of every woman when she takes up the paper and reads it. That is doing more to distribute the common wealth of the common people all around the commonwealth than all the legislation and all the Reds and the Socialists and everything else and doing it equitably.

That is what has happened to civilization. Advertising has created tremendous wants, needs—imaginary if you will—but still economic needs, in the hearts of the people; and the people have revolutionized their lives, speaking economically. We have passed through the greatest revolution ever known on this planet, a bloodless revolution, in which today goods are more nearly, more approximately equitably distributed than they have ever been on earth before. We have created a great economic surplus, the like of which man has never known before. That economic surplus, despite the swollen fortunes which last here and there for a moment or two, for a year or two, or for a decade or two, but never for a generation or two between its rise and fall —that economic surplus is equitably distributed among the people who earn it, not by reason of any law or legislation, but largely in spite of it.

If my father who came to this town of Columbus as a young medical student back in the forties could see today what high visions have come true in his profession or in any profession that you may name, the luxuries that the common man enjoys—luxuries of transportation, of communication, all the luxuries of life that are the common heritage of the common man—if he could have seen that in the forties, he would have said that was a Utopian dream that will not come true for a thousand years. Yet it is true. It is true today because of this demand built up through the advertising columns of the newspapers. But it is true today, more true than it ever was before, that any man who works, whether he works with his hands or his brain, receives more nearly exactly what he earns, and earns more nearly exactly what he gets, than any man who ever labored with his brain or hand on God's earth since the beginning of all time. Now, that is the revolution that has been accomplished, using the press as one of the levers, one of the Archimedean levers that has moved the world.

What are we accumulating this great economic surplus for? Why this tremendous standardization that we see from the Caspian Sea to Honolulu? Why have we distributed these luxuries until they are mere comforts, these comforts until they are actual necessities, among the peoples of the earth, and particularly among the Americans? Surely it is not very important that we have 70 percent of the world's telephones, and 60 percent of the world's automobiles, and say 40 percent of the world's gold—or even maybe a little more. These are not very important in and of themselves. They are means to some end.

What is that end? I do not know. Only I know that God did not make all this change that has come in the last forty years here in this civilization for and because of the change itself. Men do change with new inventions, with new civilizations. Man was never the same after he invented fire as he was before. He was never the same man after he invented the plow or the lever or the wheel. He was never the same man after he came out of the woods and became a farmer. Psychologically he was never the same man after he hewed out a log and made the first boat and established commerce around the Mediterranean. Psychologically he has changed every time. And with all these luxuries we are a different people from the people of a hundred years ago.

Look at our eyes. They look squarely into every other eye in the world. They say that the American eye has a certain impudence. It has the impudence, the assurance of self-respect. That is a new psychological attitude. This tremendous economic surplus that has been made for the first time without slavery. We have another kind of slaves now, the slaves of the lamp of science. We rub the lamp, and the genii work for us, building this great surplus based on science. We are served by these genii justly, and we have got our surplus honestly.

Now, what are we going to do with it? We are going to do something. We are gathering like blue birds about to fly into the next stage of an immense journey, I do not know where. Man did not know where he was going any time along his journey. He has had the notion that he has been on his way, and he has changed and is changing. And this newspaper of ours has been of service. I have not a very high opinion of the editorial end. I am an editorial writer myself, but I have a profound respect for the dynamic quality of the advertising page. Let me illustrate by a modern instance. You have heard of the new invention, the television, which will bring you the actual scene through radio on to the screen. You have seen an account of television on the news pages. It does not make much difference, that editorial writers have theorized and philosophized about it. It has not made much difference yet. But when you see the television glittering on the advertising page, it will get into your lives.

So I have got a great respect for this great thing called advertising, this great lever, which in this particular age has moved the world. And when this lever goes, our newspaper business will go back to its former state. We have standardized ourselves out of editorial influence, but we are still doing God's work in the world through the advertising pages.

All of this neighborly gathering together of classes that were once separate, all of this distribution of wealth equitably and honestly that has come as the result of this change, are founded upon an old philosophy whose chief teacher said, "I have come to bring a more abundant life." And all this neighborly widening of the circle of privileges which once was narrow and close and now is almost as broad as our nation, all of this fine brotherly feeling which comes, not out of politics, but out of a re-organized business, that also is a part of that philosopher's creed who said, "I am the way, and the truth, and the life."

GENERAL PROGRAM

FRIDAY, APRIL 8

THE ELEMENT OF THE INDIVIDUAL

PAYSON SMITH

Commissioner of Education, Massachusetts

Members of the Conference:

The President of the University has just stated that this is the Seventh Annual Conference. I am about to say to you two things which I am sure have been said at each of the preceding conferences, and that will be said at all of the conferences yet to be held. These things must be said before any educational conference closes, and I may as well say them and have it over with.

The first of these is that all who have assembled here represent the most fundamental industry of the commonwealth, the industry of education. The other thing is that this industry of education has been established in order that we may produce for these people an intelligent citizenship.

Now, I am quite willing, in a broad and general way, to accept citizenship as the objective of public education. I believe there is no other justification for the maintenance of a system of education supported by the taxes of all the people except a justification that it will result in a general social good. Taking that term in its larger significance, considering it not only in relationship to political citizenship, but in all the relations of life, I think we may as well say that the object of our educational program is a social one. The end is social, but, if the end is social, the means by which we shall achieve that end must be individual. There is no way of improving democracy, except by improving Democrats. I am not talking in a party sense, although I know a Democrat or two that might be improved a little, and we should all gain thereby. If you ask me and let me think a minute, I believe I can name a Republican here or there who can do the same thing to our mutual advantage.

You are of Ohio and I am of Massachusetts, so we may safely speak of the recent election in Chicago. I observed in the editorial of a local paper that the election did not work out as well as we usually think it will; for, when the citizens of Chicago turned out almost one hundred percent of those entitled to vote, they voted for Thompson for mayor. In other words, it appears that Chicago, like Ohio and Massachusetts, may perhaps need not a mass of citizens who are led by herd emotion, but it may need, as these other cities and our country as a whole may need, a considerably increased number of individuals who carry their conscience with them and a reasonable amount of intelligence.

What I have to say is that we must organize or we must conduct a school system that considers primarily the individual and must think of the objective which is to be obtained, namely the large social one, in terms of the individual. I am going so far as to say that it is not possible to educate a group as a group, a class as a class. I am not denying that there are certain educational reactions that come from the group to the individual; but I insist that, when you get the sum total of the result of the education of a class, you will find there what has been done for all the individual members of that class.

If we are to have an educational system that will be more effective in the education of the individual, there are some considerations which may well be borne in mind, and it is my desire to mention some of them. First, there must be, I think, a careful discrimination or understanding rather of the difference in the functions of administration and of teaching. Organization, may I say, does not have, I think, much educative power. I doubt if organization ever educated anybody except possibly the organizer, but I am not sure of that. We have depended widely upon organization of education for the educational result. You may have heard of that famous French minister of education who used to boast that he could tell what was going on in any of the schools of the French Republic at any given time.

I met his American prototype, not so long ago, in the office of the superintendent of schools of one of our cities.

When I told him I wanted to visit his schools, he said that before I went into the schoolrooms he wanted to tell me about the remarkable school organization which he had and that he could do it, as any good superintendent could, by pointing to some charts. Then pointing to some charts that hung on the wall, he said, "By referring to these charts I can tell you exactly what is going on in every classroom of this city at any given moment. I can tell you the subjects that are being taught. I can tell you the methods that are being used. I could almost tell you the questions that teachers are asking children as we are sitting together here." Then he went on to say, although I am sure he was joking, "I can almost tell you the words in which the children are replying to those questions."

We have had in the past great expectation that that sort of supervision and direction would produce an educational result. But no such expectation can be justified. I may say to superintendents of schools who are here that I think there is little use in being interested in any kind of educational reform, or the teaching of any subject, unless you have teachers who know those subjects or know where to get teachers or know how to train teachers for that purpose.

There are a great many reforms proposed that have failed to affect permanently the American schools, because they have never come into the classrooms. That is not quite accurate—because they have never gone beyond the office of the superintendent of schools. You will recall how great an interest there was some years ago in nature study, and yet nature study never made a deep impression upon American education for the simple reason that we never had sufficient teachers who were familiar enough with nature study to be competent teachers of that subject.

We must keep in mind, also the fundamental aim of education which is neither of two things which we find commonly in our schools. One of them more common in the present than in the past is propaganda. Our schools everywhere are loaded down with propaganda on the basis of the theory that the purpose of education is to tell people what to think. It is not the business of education to tell people what to think. It is to teach them how to think. I do not know how it is in Ohio, but I can tell you that in Massachusetts we have special days and special weeks and special pressure of all sorts and of all kinds. We have an enormous amount of propaganda, which I believe has not any proper place in the schools.

The other fundamental aim, of which I think we have less, is preparation. We have had a school system that from kindergarten to the high school has been based upon preparation. We send children to the kindergarten to prepare them for the primary school, to the primary school to prepare them for high school, to high school to prepare them for college, and to college to prepare them for life. Then, I suppose, if our theology is as sound as it ought to be, we should spend the days of our life preparing for eternity. In my opinion, this objective of preparation has done not a little harm to real sound education.

I take an example or two. I take modern languages as one. You know during the war there was a great deal of discussion as to whether or not we should teach German in our schools, and most of us thought we should not. We thought it not quite patriotic to teach the language of a people with whom we were at war. We learn later that in some of the schools of France and England they had paid more, and not less, attention to the study of German. They likely were acting upon the advice of Carlyle who said, "It is a good thing to know the language of your enemy." However, that may be, I could not get excited over that discussion. It did not seem to me that it made any difference whether we taught German or whether we did not teach German, whether we let it stay or whether we let it go. Because in the wildest flights of my imagination I could never conceive of any circumstances under which an American school boy or American school girl could get a military secret out of a German or communicate one to a German if he had to use the German language.

The reason for that has been that we have taught German, as we have taught other modern languages, largely with the purpose of giving to the student a body of knowledge upon which he could be examined in the hope that he might enter college. The objective was neither the ability to use it nor the ability to appreciate it, but the ability to show that he was prepared to pass an examination in it.

The other example which I usually choose is physical education. I am sometimes asked whether we have in my state a program of physical education, and I am proud and happy, of course, when I answer, "Yes, we have had a twofold system of physical education for many years. We have had there a system of physical education which has provided for taking into the arena a group of boys, already well developed physically and preparing them for competition against other boys similarly selected. We have not neglected the others, for we have put them by tens of thousands—yea, hundreds of thousands—upon the bleachers in order that there they may get lung-development. That is the twofold system of physical education that we have had, and suddenly it seems to be dawning upon us, as it will upon others, that physical education of the right type ought to provide for individual growth and development.

I complete the circle when I say that the correct objective of education, I believe, is growth or development and not preparation. The other day I heard a new definition of education—new to me. A man said, "Your education is what you have left after you have forgotten the things that you have learned." You are your education at any given moment. I think, however, that it is extremely important that attention be called to the assumption which underlies the definition, that the person being educated at least sometime or other knew something.

I believe a program of education directed to the development of the individual, of course, must be based upon a knowledge of the individual child. We often say that the important thing is that the teacher should have sympathy and affection for her pupils, and I agree to that. I heard a man say once that he thought the most important thing in a teacher was that he was a master of the subject that he was teaching. But I agree with those who feel that that teacher is to be preferred who understands the child.

There must be a liking for children, not only in the abstract, but the successful teacher must be in sympathy with and have an understanding of the individual child who is to be taught. There must be a liking of the individual as such, and not like that of a certain college professor—not in Ohio State University—of whom I heard recently. He was having a new sidewalk built of plastic material, and while it was being set, some boys ran across it and left two or three footprints. The professor was so annoyed that he used unprofessional language in talking to the boys about what they had done. A brother professor overhearing him said, "Why are you talking to them so roughly? I thought you liked boys." He replied, "I do but not in the concrete."

It is not enough that we should like children in the abstract nor that we should have sympathy with them as a crowd. We should know this child of ours at certain points, and, I think, we should know him with reference to his individual tastes. I wonder to what extent we fail in our instruction of the individual child, because we construct for him an educational program from the adult point of view?

A few years ago, I had the great privilege of serving as President of the Department of Superintendents of the National Education Association. It fell to my lot during that time to appoint a commission to organize or re-organize the curriculum of our schools, and I was glad, indeed, to call to the service of the commission a great many very able men and women in this country. I have sometimes felt I made a mistake in not appointing to it also a few children in order that they might make their suggestions of what ought to go into a course of study. As the study continues I am somewhat relieved when I remember, these children would have been quite old men and old women before the findings of the commission are complete.

However, it is true, I think, that very much of our instruction is organized about the standards of the teacher's desk. I recall an experience of my own when I was a boy in high school. We had a teacher in English who made us feel that we ought to become interested in the stories of Charles Dickens. I shall never forget how hard I tried to please this young lady lately come from a New England woman's college and to prove to her that I had intelligence enough to appreciate the stories of Charles Dickens. But there was nothing in my experience, in my background, in my environment, in my developed taste if you please—a boy growing up in a New England seaport town—that enabled me at that time to understand and appreciate the stories of Charles Dickens. I shall never forget how much I envied my mates who were able to claim, aye, prove, that they had an interest in the stories of Charles Dickens. I came to the sad and devastating conclusion that I did not have anything anyhow but a "Horatio Alger" or an "Oliver Optic" mind, and that there was not any use for me to try to get interested in the stories of Charles Dickens.

A number of years later I was in Boston in a bookshop—nearly all shops in Boston, you know, are bookshops—and I bought a leather-covered copy of one of Dickens' stories, because I thought I ought to have at least one story of Charles Dickens lying about the house for appearances' sake. I took that book with me on a trip and I read it and enjoyed it. I got another and read that and enjoyed that, likewise. I had come, in a manner of speaking, to Charles Dickens. I wonder if any of you have ever had a similar experience with Dickens or some other author.

If you have, do you not agree with me that if we are going to be fair to the children who make up these classes of ours, we are not going to expect them to have a certain class or group taste in literature, and that we are going to take into consideration the differences in taste. Certainly we are going to take into consideration the difference which we may assume between others and ourselves.

Then we are going to know these children with reference to their capacity. There are two things that one may do for a child, either of them bad: one is to give to the child a burden that is greater than he ought to carry, and the other is not to give him a burden equal to his strength. To find exactly the capacity of the child, that is a project in education which must be achieved if we are going satisfactorily to approach this problem of the education of the individual.

The really great triumph which we achieve comes from the attacking of that thing which is really worthy of our strength and worthy of our mentality, with the sense of satisfaction that comes from having achieved that.

No greater disaster can come to any individual than to go through a series of failures because of too high expectations placed before him. That breeds the habit of failing, and I am afraid it is rather easy for an individual if he is constantly given tasks beyond his capacity, to establish in himself that habit. The public school ought to consider the individual differences of each child and put before him the challenges to his own capacity so that he may achieve success in relation to himself.

We are sometimes asked whether or not the course of study is overcrowded. Of course it is, and of course it is not. The course of study is overcrowded if we are going to expect all children to take all parts of it with the same result. But the course of study is not overcrowded if we regard it as a reservoir out of which teachers are to be permitted to draw those things that will appeal to the varied conditions of the children whom they teach.

Again, I think we ought to know this child somewhat in relation to his developing responsibility. I think there is nothing more important for those of us who are engaged in the work of training teachers and those of us who are engaged in the work of directing teachers, than to consider this element of personal individual responsibility on the part of the person whom we try to educate.

We are in a day of great expenditures for education. We are spending large sums of money for equipment. We are spending millions of dollars for buildings—and they are superior buildings and the equipment is the finest that can be had. We are training for our schools tens of thousands of teachers in order that technical skill may be in the possession of those who are to teach our children. I think we ought to remind ourselves that there is not money enough in this country of ours to buy an education for a child, that no building can be built that is fine enough, and no equipment provided for it that is rich and varied enough, and no teacher trained to be so skillful, that combined they can bestow an education upon an individual. If you ask me, I will say that I think one of the great problems for us to consider is how we shall so teach that we shall develop not so much a better technique of the teaching by the teachers as a better technique of learning on the part of the students.

I have very often had parents say to me—as you have had them say to you—"This teacher of ours does not help children as much as she should." We do not need more teachers who will help the children, but we do need more teachers who will have the wisdom and the skill and the understanding to help children to help themselves. What we need to get in our education of the individual is a little more of the element of individual responsibility on the part of the child for his education and we need this to the end that we may get in our citizenship as a whole a larger number of individuals who will understand something of their individual responsibility for the various undertakings of adult life.

Finally, I think, we ought to consider this child on the basis of the way in which we shall measure improvement. I am speaking here, I can assure you, with the greatest humility, because I realize that sitting on this platform is the man who has made more wise contributions to the psychological tests and to the measurement of school children than any other man.

Surely we are getting away from the competitive challenge. The finest challenge that the individual can have is not the challenge of the work of somebody else, but the challenge of what he himself may be able to do. We have not got altogether away yet from this notion of rating people in comparison one with another and on the competitive plan. I picked up a newspaper only the other day. This was in New England—it would not happen in Ohio. And I read in that newspaper that two girls in a certain suburban high school have received the class honors this year, and will recite, one of them the salutatory and one of them the valedictory, the first of them achieved the record of 96.7 and the other, a record of 96.5. I wonder if I should meet their teachers whether they could tell me just what there was that made the difference of two-tenths percent between them.

It reminds me of the old story that Colonel Parker used to tell—that leader in this field of education for the individual. A school teacher was waited upon for a certain time by a certain young man, and the time came when the important question was to be asked. He did ask it, and very much to his surprise this school teacher took out a piece of paper and a pencil and began to make figures. The young man said, "Why, Mary, don't you know I have asked you the most important question that a man can ask a woman, and there you go to work, school ma'am fashion, making figures." She said, "Yes, John, it is a very important question, I realize that, and I knew it was coming." She had been keeping a record ever since he had been courting her. She had it down there in black and white: perseverance, 99.5 percent; good looks, 21.5 percent; and everything else between those two extremes. She had added up her figures, she looked up at him with tears streaming down her cheeks, and she said, "Oh, John, I'm so sorry it can't be. Because you know the passing mark is 80, and your average is only 79.5."

I do not need to say here in this presence that that story is untrue. There is not a word of truth in it. It never happened, and you know it, because you know that if the teacher had really wanted that young man, she would have found a way to mark him up five-tenths of one percent.

What I am pleading for finally is a changed point of view which will direct us away from the notion that the crowd is the important thing, from the feeling that you are not doing any piece of educational work which is really worth while unless it concerns a mass or a class. We must develop in ourselves and in our teachers the belief that the one hundred and twenty million people of this nation are going to make an effective democracy only as we eventually get each of them working according to his capacities, and his individual powers, until each will be making his best contribution to the common good.

Once when I was superintendent of a small system of schools, a teacher came to me seeking a position in the grades. I told her of a place in a rural school which she accepted. After a few weeks she called on me again and asked when she could be transferred to the city.

I said, "I don't know. Don't you like your school?"

She said, "No, I don't."

I said, "Why don't you like it? Is it because the people aren't kind?"

"That isn't the reason."

"Is it because I haven't given you what you need to work with?"

"That isn't it."

"Aren't the children satisfactory?"

"They are a splendid class of children."

Then I said, "What is the matter with that school?"

"Why," she said, "It's this way. You know I went to a normal school, and I got ready to teach. I want to do now some real educational work."

I said, "Why don't you do it?"

She said, "I can't do it there."

"Why not?"

She said, "That school is so small."

"How large is it?"

She said, "Why, there are only twelve children in it."

Then the significance of that figure struck me in an instant. I said, "My dear young lady, there are only twelve children and you. Do you realize that the great teacher of all teachers saw that the world was not to be saved, and not to be regenerated except through the influence of those twelve disciples who under his teaching went out and who preached his message to the world?"

I think in this day of crowd thinking, in this day of herd action, we who are engaged in education might take a lesson from that great teacher and understand that only as one by one we are able to send from our classroom individual units, men and women, each one able, prepared, and desirous of doing his part, only then shall we justify the thing we stand for, namely, education.

GENERAL PROGRAM

SATURDAY, APRIL 9

THE NEW MEANING OF GEOGRAPHY IN AMERICAN EDUCATION

WALLACE W. ATWOOD
President, Clark University

Mr. Chairman, ladies and gentlemen:

I appreciate that it is very kind of you to come to listen to one who is speaking on a theme which sounds like his own academic hobby. Especially is it true today when we want our attention centered upon the individual whom we are trying to educate. Nevertheless, I hope you will see, throughout the address, that my effort is to guide you to a view of broad significance in whatever subject you may be teaching.

I think this address might have been entitled "The large movements or trends in the world which are leading us as a nation to appreciate the significance of knowing other peoples." Never before in human history has there been such an awakening of interest in the affairs of the world. When we go home this evening, we will find a boy or a girl who will "listen in" to hear, if possible, an address or a concert given in New York, Chicago, San Francisco, or even London. The boys in the physics laboratories will be carefully "tuning-in" to detect those tiny electric waves that are coming from Australia. They may try to send waves to Australia, for college men tell me that they correspond in this way with the most distant parts of the world. Perhaps someone here wishes to speak to a friend in London. That is quite possible. It is being done from the seaboard frequently by men who believe that three minutes of conversation is worth $75 to them.

We are all reflecting, perhaps unconsciously, an interest in other peoples. Over a million of us take the *National*

Geographic Magazine. Mr. Grosvenor believes that there are five people that look over each copy of that magazine. So he says he has a university consisting of five million people that he is educating. Many of us take the *World's Work,* or *Asia,* or the *Travel Magazine.* Why is the quarterly *Foreign Affairs* published? It is a real contribution to American magazine literature and brings before us many of the political problems of the world. Why has a university recently launched a new journal of *Economic Geography?* The appearance of such publications reflects the rapidly growing interest among the American people in the great, wide world about us. The many books of travel that are coming out, the lectures on exploration, special newspaper articles, and even the headlines in the morning paper, all reflect the broadening of our interest and a new world point of view that we are certain to take.

In coming into any one of the great seaports of the world, one is impressed by the immense cargoes that are there being exchanged. The tropics are contributing each year millions of tons of freight to the people who live in the temperate zones. They send to us rubber, fruit, sugar, and coffee. We return cargoes of flour, clothing, machinery, and various kinds of manufactured goods. The open, pioneer countries of the world supply much of the wool, meat, and hides that are consumed in the older and more densely settled sections. These economic products that are passing from one country to another serve as little messengers for with the transfer of commodities there is always some transfer of ideas. Perhaps it is a shipment of cotton, from our southern states, that has established certain friendships, or a shipment of a carload of rubber tires from Ohio to a distant land that has led to many new associations. Our American farmers in the great wheat belt of Minnesota and Dakota recognize that in most years 10 percent of their crop must be sold in a foreign market. There wheat must go into competition with the surplus wheat of Argentina and Australia.

We all recall a movement that started a few years ago when the British and the Dutch decided to limit the amount of latex that they would allow to be shipped from the Malayan States and from the Dutch East Indies. The price of crude rubber jumped at once from 13 cents to 35 cents a pound and then soared still higher. The price of everything that contained rubber went up and undoubtedly everyone of us was hit. Herbert Hoover, our keen-minded Secretary of Commerce, immediately asked Congress for $500,000 to be used for an investigation to determine whether or not we could produce rubber in the Philippines or somewhere on the Western Hemisphere, either in the southwest part of our country or in the tropics. Could we get the Western people to raising more rubber? Could we produce rubber anywhere and meet that competition?

Remember that there is a little difference between those who clip the wool from the backs of the sheep in Australia and those who own the sheep. And what happens? The reaction in the world markets for wool is just as quick and just as certain as the change that is recorded on a thermometer with the change in temperature or a record on the barograph when there is a change in atmospheric pressure. Even if there is danger of a reduction in the clip of Australian wool, we will all be affected. Word comes instantaneously through the air across the Pacific, across North America, and is picked up at the great receiving station on Long Island. That word goes by relay to Boston, the greatest wool market of the world, and it is sent by telephone throughout New England. Before the day has passed, the New England merchants will put up the price of woolen goods. The price of a woolen suit is soon up and a woolen dress pattern goes right up.

We are each one of us affected by each one of these movements. If the Argentine wheat crop is unusually large, the farmers of this country and the Canadian farmers in the Northwest are sure to be directly affected. The surplus supply from South America will reduce the price of all wheat in the Liverpool market. Our farmers may find it necessary to borrow money. They may find it impossible to send their boys or girls to college.

For the first time in the history of the world, the United

States is a great creditor nation, and we are seeking places in foreign lands where we may invest our surplus capital. This will certainly broaden our interests. The British have had that experience, and you know what an effect it has had on those people. They have not limited their sphere of interest to the extent of the British Isles; they have become interested in the entire world. They went out as colonists, and today their young men are willing to live in distant lands. Our young men are just beginning to think of business and professional opportunities in foreign countries. They sometimes ask, "Can you give me an opportunity to go to China, Japan, or South America?"

With the accumulation of surplus capital in this country, we are sure to take an important part in the development of resources of other parts of the world. Most of the young men whom we are educating today are going into the great business world, and they will certainly feel the influence of this movement in commercial affairs.

What does this all mean? We have come to a time when the civilizations of the world are mixing. What is really at the bottom causing the troubles in the Near East is the effort those people are making to take over our ways, our Western methods of doing business, our Western political ideas, and even our social customs.

Professor Toynbee takes the position that we are to blame for the troubles in the Near East. Unintentionally, we have upset economic and political conditions in several parts of the world. Our civilization has come to have a very wide-spread influence in the world, and the people of many lands are finding it necessary to adjust themselves to our ways.

I have just returned from the Orient, where I have studied the Japanese and the Chinese with rather unusual advantages. The Japanese have taken over in the last fifty years much of what they wanted of Western civilization. Many of them have attended American Universities, others went to Oxford or Cambridge or Heidelberg or Berlin or the Sorbonne. Some came to our schools of technology and medicine, and others attended our business schools or served in American business houses. They have taken over what they want of our science and of our technology. You would be shocked, if you have not been in Japan recently, to see how easily they take over anything they want from our American, British, or German science or arts or technology.

As you come to Osaka, you see a great congregation of chimneys that would make you think you were going through Pittsburgh or South Chicago or Gary. As you go through their modern cities, you recognize that the change is coming very rapidly. They have, in many ways, adapted themselves to Western civilization. Or, putting it better, they have taken what they wanted of Western civilization without destroying their charming personal qualities or their love of art, or their love of all that is beautiful. They are a cultured people. We, as a people, certainly as we were represented in Washington, showed our ignorance, our lack of appreciation of that nation, when we unnecessarily and discourteously "slapped them in the face" a few years ago. They are standing it in a polite fashion, but it hurts.

May I tell you of another place where Western civilization is coming into the life of a nation? In the background of the turmoil in China, a remarkable drama is being enacted. Changes are taking place in the ways of thinking, in the literature, in all of the educational work, in the economic and political organizations of the nation, and in international relations.

There never has been in the history of the world a more remarkable renaissance than the one now in progress in China. An ancient culture and civilization, one that for centuries was indeed superior to anything on this earth, is evolving from within, a new culture and a new civilization. Long before the opening of the Christian era, the Chinese were manufacturing beautiful works in bronze, and they were familiar with silk culture two thousand years before the birth of Christ. They discovered the art of making paper about 100 A. D. At the time of the Norman Conquest and of the Crusades, the Chinese were printing with movable type, painting with remarkable skill, and also making beautiful porcelain. They invented gunpowder in 700 A. D. and the compass in 1100 A. D. They abandoned the feudal system fully two thousand years ago and evolved a rather simple type of government in which the family was the unit, and the local community often defined the sphere of interest of the family group. They were a peace-loving home folk and failed to develop a strong national consciousness.

The educated group among the Chinese evolved a literature and a religious culture. They studied the classics in their own language, and many of them, after passing through a series of most exacting examinations, came to hold government positions. Millions of the Chinese became farmers and used a part of their time in home industries. Thousands became craftsmen or artists. Theirs was a culture where the scholar ranked highest; the farmer, second; the craftsman, third; the tradesman, fourth; and the military man, fifth. They have always been preeminently a peace-loving people and never aggressive in their dealings with the other nations of the world.

Even today there is much of the primitive culture represented in the life of this nation. Spinning wheels and looms, such as we find in attics of New England, are yet in use throughout the rural districts of China. In the villages not yet affected by foreign merchants, the Chinese are busily engaged as craftsmen, carving ivory or wood, and making pottery or porcelain or lacquer work. They are manufacturing silk or cotton cloth, or engaged in embroidery work or rug-making.

In this nation and emanating chiefly from those who have been educated in the universities of this country or the countries of Western Europe, there are movements under way that are bound to result in most significant changes. These people have abandoned their ancient system of education, which consisted in large part in memorizing Chinese classics, for the study of Western science. In the universities, many of them endowed and conducted by the Chinese, the students are at work in the laboratories of physics, chemistry, and biology, carrying out the same experiments which the college students of this country are performing. They are adopting a new scientific scholarship.

In this renaissance of learning, Hu Shih, a young Chinese scholar, has played a conspicuous part. He boldly recommended the abandonment of the ancient language known as "ku wen" and the use of the spoken language in written form. "Ku wen" was a language which no one spoke. It has been dead for at least two thousand years. It was a beautiful but a lifeless language, a classic. "Pai hua" or the spoken language is now being used in the schools of China, and this change has virtually brought about a literary revolution. It has remade the school text and the school life of millions of young Chinese people. Their work has been made easier than the work could ever have been for their fathers. It was necessary to know tens of thousands of characters to write the "ku wen" language, but everyone in China has a "pai hua" vocabulary and with relatively little instruction can be taught to write that language and to read it. "The Thousand-Character Movement" which James Yen, a Yale graduate, has adopted in his remarkable work in mass education has been of great help in leading those who have never had any schooling to a knowledge of reading and writing.

"Jimmy" Yen's movement for mass education is sweeping over the country with great rapidity. It is not identified with any faction or with any particular section of the country. His volunteer teachers, now numbering thousands, have enrolled in their classes more than four million students. These students range in age from fifteen years to fifty-five.

In Europe, probably fully 90 percent of the people of any one country cannot understand the language of any other country. In China most of the people who have lived all of their lives in one province cannot understand the language used in another province of their own country. As the movement for mass education proceeds, this condition will be gradually changed; and it is possible that in time one language will be used throughout China. Then there will be in eastern Asia, the largest aggregation of people in the world who can understand each other.

This change in the written language of the Chinese people has led them boldly to question many of their old customs. Dr. Hu Shih frankly admits that the youth of China are today questioning even Confucianism, Christianity, the marriage customs, and many other long-established habits among their people.

The Chinese have established technical schools, public libraries, normal schools, higher normal schools, and at least eight government universities. All of these indicate that in the background of the turmoil which we have reported to us in the daily press, there is a great renaissance in progress in the thinking and in the education of the Chinese people.

We may go further. The Chinese have already established modern industries for the manufacture of cotton and silk. They have a Geological Survey organized, and under the direction of this national service, the mineral resources of the nation are being studied and mapped. An educational committee in Peking is endeavoring to protect and preserve the remarkable works of art in the Forbidden City; a Famine Relief Committee is at work educating the rural communities in ways whereby they may prevent floods and thus avoid famines. Publications are now coming from their own presses. Over one thousand daily, weekly, and monthly journals are published by the Chinese for their own people.

They appreciate that they have developed a large share of the foreign trade of the world. During the last fourteen years, according to statistics from a British source, the foreign trade of Asia has increased 36 percent; that of North America has increased 37 percent, but the foreign trade of Europe has decreased 11 percent. Last year, the Chinese bought from the United States $129,000,000 worth of goods. That was an increase of 12 percent over the purchases which they made from us in 1925. During 1926, they exported to the United States over $172,000,000 worth of goods. That was a decrease from the amount shipped to us in 1925, but that decrease was due to the unsettled economic conditions within their own country. Silk and silk products made up $55,000,000 worth of the goods which they shipped to us. Furs and goat skins, wool-oil, and tin are among the leading exports from China to the United States. Shanghai and Hongkong now hold important places among the leading ports of the world in the total tonnage of goods transferred at their harbors.

In the midst of all the changes in China—in methods of thinking, in the educational work, in the trade and industries—there is developing in the minds of many a new and stronger national consciousness. The people of China who have become acquainted with the progress that has been made in the other countries of the world recognize the necessity of reorganization in their country of the form of government, of their internal system of taxes, of the tariff regulations, of foreign trade, and of most of their international relations. They are now more intelligently conscious than any foreigners of the many-sided nature of the reformation through which they are passing. They are more intelligently conscious than foreign people of their own internal or domestic problems. They recognize better than other people the magnitude of their present undertakings and the patience that must be used among themselves in bringing about the many necessary revolutionary changes.

There is no conquering of the Chinese. Many peoples have tried that in the past and they have been assimilated. In time, they have become Chinese. Any who attempt conquest in the future, are in danger of the same fate. The Chinese have strong characters and conspicuously strong personalities. Think of four hundred and thirty-six million people in one nation; that is about one-fourth the population of the world, and they are essentially all of one race. There is no such aggregation of people with so much in common anywhere else in this world. They equal in numbers the entire population of Europe. Remember, also, that about 90 percent of the Chinese people are farmers and most of them own their own land. They are capitalists not likely to become communists. They have never been committed to a strong central government. They are not likely to adopt state socialism. No one within or without China can predict what is coming, but the drama is proceeding rapidly. Dr. John Dewey wrote a few years ago, "To the outward eye, roaming in search of the romantic and picturesque, China is likely to prove a disappointment. To the eye of the mind, it represents the most enthralling drama now anywhere enacting."

She is enacting a drama which will bring about a reorganization of economic and commercial relations within the country and with the other countries of the world. She is certain to play an important part in the economic affairs of the world. As time passes, she may make important contributions to education and to modern science. China should now have the sincere sympathy of all intelligent, liberty-loving people. She is passing through a stage of remarkable internal developments. She is endeavoring to make the necessary readjustments in her own civilization so that she may cooperate and compete with the civilization of the West. In a very true sense, Western civilization is to blame for the revolutionary changes that are taking place in China today. China's history leads us to expect that she will strive for the establishment of peace among the people of the world.

In our own history as American citizens, we have played the game of isolation and in the judgment of many we played that game too long. We were naturally much interested in our own development and especially in the exploitation of the wonderful resources of this most favored land. As a people, we moved westward into one great geographic region after another, opening up the great farming region of the Mississippi valley, the wonderful ranch lands, the mining regions, until we reached the Pacific Coast. During that period of expansion and of great internal development, we built up in this country a belief in isolation and a kind of superiority complex.

When we now face a problem of teamwork with the other nations of the world, we find many of our older men holding aloof. They are unwilling to cooperate with other peoples. For one I am ashamed that we have not been willing to sit down in council with our feet under the same table with the representatives of the other nations of the world. That I think is the ideal we must look forward to. We need that spirit of cooperation. The Chinese and the Japanese have given up the policy of isolation. The day when we could practice isolation is past.

Let us turn our attention for a few minutes to another world movement that is of great significance. Most of the great lowlands of good soil and sufficient rainfall are densely populated. There are four hundred millions on the lowlands of China, three hundred millions on the lowlands of India, four hundred millions in Europe, and most of them are on the lowlands, and about one hundred and ten millions on the lowland plains of North America.

We know as well as any people on earth that we cannot have a good farm for the asking. Our grandparents could when they moved west from New England into these states. They found the choicest of farmlands available for them. The best lands of this country have now all been appropriated. We cannot move our fences in town or the boundary lines of our farms without trespassing upon the rights of someone else. The lands that are left must either be irrigated, or they must be drained, or they must be fertilized. Possibly they are too far from markets. On some lands now in use one must count on a crop failure every other year. Every time we move out into the less desirable lands, we pay an additional price for our product. It may be in the cost of irrigating or of drainage or of fertilizing.

While we have been exploiting our lands, and securing some outlying territories, the other peoples of the world have moved out. They have gone over the entire world, and they have appropriated all the lands in the world that are worth having. Do you know of any land anywhere that is worth having that some nation does not hold? The tiniest islands that look like fly specks on a map, are jealously held by the British or the Americans or the Japanese.

We could not hold the Washington Conference on Disarmament until a preliminary conference was held between the British, the Japanese, and the Americans to determine how the delegates were going to speak when they came together in the general conference regarding certain small islands in the Pacific. It may be just a question of cable landings or a radio station or a harbor for a navy. We are watching over certain islands, and they are watching over certain other islands. There is not a bit of land anywhere on the face of this earth that is worth having that some nation is not holding and ready to protect.

We see the French and the Italians pressing over into the Sahara and trying to use that desert land. We see the Javanese and the Dutch going higher on the mountain sides. The Chinese and Japanese cultivate their farm lands most intensively. The Chinese are pushing over the mountains into Mongolia and northward into Manchuria; Americans are trying dry farming in semi-desert regions of the west; in Holland lands are being reclaimed from the sea; in Finland forests are being removed to provide more croplands. Wherever the pressure of population is being felt, the people must move on to the less desirable lands or be absorbed in the great industrial centers.

These conditions call for more efficient organization in the development of natural resources and in the exchange of commodities among the peoples of the world. They call for a better understanding among the various peoples.

Again, we come back to the fact that as we move on in the utilization of the resources of the world, we must have more contacts with other people. It is not a theory. It is actually a fact. We depend upon the activities of people in other parts of the world for many of the essentials in our modern life. We are vitally concerned with what is going on even in the most distant parts of the world.

This point of view is most naturally forced upon a geographer, and it gives a new meaning to that old-fashioned subject. However, it is a point of view that I think is just as essential in a lesson in history or a lesson in civics. It is quite as important in the discussion of current events as anywhere in our school work. It is a point of view toward national development which I think is absolutely fundamental to good citizenship. We must not, as American citizens, take a narrow point of view. Of all people in the world we are most indebted to the other nations for we are made up in our own personnel through contributions from all of the leading nations of the world.

The point of view for which I am pleading can be taught in the classroom tomorrow. It is nothing but the relationship of one person to another or of one group to another expanded until we recognize the place that this nation should take among the nations of the world.

The removal of ignorance of the other peoples of the world is one of our great responsibilities. This should be largely accomplished through the proper teaching of geography. I look forward with hope and confidence that we will teach, with the point of view of developing an intelligent sympathy for the other peoples of the world.

I would like to tell you of one little touch of humor which I enjoyed and which helped me to come into sympathy with the Chinese a little better. It is just a little story, but sometimes a touch of humor gives us an appreciation of how the other fellow's mind works. It is a story of a boy who had his birthday on the twenty-second of February, and his name was Washington George. This boy, a very good little boy, as they tell the story, was out in the garden in the morning making clay Buddhas. That, of course, was in keeping with his character.

The father came out and said, "Washington George, this is your birthday anniversary, and I am going to make you a little present." And he gave him a hatchet. He went out for a walk. He came back, and in the habit of cultured Chinese, took out his little bird in a cage for an airing in the garden, exercising the bird, and encouraging it to sing a little. As he walked through the garden, he came to the place where there was a beautiful Japanese cherry tree that had been chopped down. He thought it was an outrageous piece of work. He called in his gardener. "Did you cut down that cherry tree?" The man said, "No, sir. I would just as soon cut off one of my limbs as injure that tree, sir." He decided that the Chinese gardener had not cut down the tree. He called his own boy. And he said, "Washington George, did you cut down that cherry tree?" Washington George fled to the women's quarters. That, of course, aggravated the Chinese man and he called him back. And he said again, "Washington George, did you cut down that cherry tree?" And Washington George looked up to his father, and said, "Father, I don't know what is the matter with me today. I cannot tell a lie."

There is a real problem in America of broadening the sympathies and the point of view of our people. We are inclined to be provincial. As educators we are all engaged in training young people who are to become citizens of this country. I am pleading for a broad noble-minded citizenship of the world. This does not mean less of patriotism. It means a nobler and greater patriotism. This point of view is important if we wish to establish better economic, political, and social conditions on this earth. It is absolutely essential if we wish to avoid wars and establish peace on earth and good will among men.

THE MENACE OF THE HALF-MAN

Harry Olson
Chief Justice, Chicago Municipal Court

Mr. Chairman, teachers of Ohio, ladies and gentlemen:

I am glad to be here to talk to teachers. I have addressed a great many Bar Associations, and yet I feel that the sort of progress of which I am going to talk today will not come so quickly from the bar as it will from the teachers of the country. This is because they deal with children and the youth of the land and see many of the behavior characteristics that I am going to talk about today in their incipiency. Then, too, I prefer to address teachers because I was once a teacher. I taught a primary grade when I was a boy about eighteen years old. The next year they elected me principal of the school, and I never see a nineteen-year-old boy but what I smile at the audacity of the board of directors.

However, the salary was not so much in those days out in Kansas. I got $35 a month for the primary grade, and at that time an ex-sheriff who had been in the penitentiary for murder ran amuck and wanted to kill the principal. The town had about two thousand inhabitants. They gave me charge of the schoolgrounds. The Board advised that we adjourn school until this ex-sheriff got over his spree. I saw a good chance to impress them with my bravery and the need of more salary in view of the desperate character of the job, so I got a horse pistol. I walked into the home of one of the Board of Trustees, who, by the way, later became the grandfather of little Billy McClintock who lost his life sometime ago. I stopped off on my way to school to tell Mr. Nelson that I was going to open school. He said, "You had better adjourn it." I said I would not adjourn it. I opened my coat and showed him this long pistol and told him I was going to go up the hill to the schoolhouse. I said, "I am doing it for $35 a month." He said, "Never mind, your salary will be increased at the next meeting." They increased it to $45. The next year they elected me principal of the school for $65. So I thought I had better get out of the profession. I did not know that the public were going to respond as they have in later years and appreciate the teacher. More and more he is being appreciated, and your smiles at the salary I received indicate that you appreciate that salary the same as I do.

I would not have to have excuses for being desirous of talking to teachers or of explaining why I was willing to do it if I could always place myself in accord with the philosophy of the story I once heard—an original one. A friend of mine came to Chicago some years ago in a yacht. He anchored it at the Rush Street Bridge. He was a friend of the late Professor David Swing. David Swing told him there was a harbor at Lincoln Park where he could park his yacht and stay, since it was an out-of-town yacht. He went up there, liked it, and anchored. In the morning he was sitting on the deck, making his coffee. An Irish policeman came along and said, "What are you doing here?" "Making my coffee." "Don't you get smart, or I'll run you in. You have no business here." "Well," the man said, "if you had been on your job, I probably wouldn't have got in here." "Now, see here, don't you get smart," he said. "Where are you from?" "I'm from Manistee, Michigan," said my friend. "Where is Manistee?" "Well it's northeast of Milwaukee. Across the lake." "Oh," said the policeman, "you don't belong here. Well, if you don't belong here, you have a right here. If you belong here, you have no right here." On that basis, I feel at home anywhere.

I am a little bit nervous though, because I am going to talk on a technical subject, and there is always somebody in the audience who knows more about it than I do. I found in addressing juries there was always somebody on the jury who was well informed, and I had to be careful in the deductions I made. Once when the crankshaft of an ice machine was involved, one side had a professional witness from Chicago, and the other a university professor. They were wrangling back and forth, and I suppose they understood each other, but neither the jury nor I could tell what the real difference was between them. When one of the jurors got up with a slide rule and measured the ice machine crankshaft, he put down some figures, and asked me if he could ask some questions from the jury box. I said, "What is your business?" "I am a mechanical engineer." "Are you a graduate of an engineering institution?" "Massachusetts Institute of Technology." "Are you applying your education?" "I am. I have charge of eighty drafting engineers for Allis-Chambers Company, an engineering house." There was a master mechanic on the jury, you see! And he settled the case very quickly. So one takes a certain risk.

Of this I can be sure, there are very few anywhere who have had more experience with the half-man, as I call him this morning, than I have had. For ten years I was a prosecuting attorney in the District Attorney's office in Chicago. The Criminal Court of Cook County was then the largest criminal court in the world. For twenty years I have been head of a court of thirty-seven judges that has a large criminal jurisdiction in binding over felony cases to the Criminal Court, with final jurisdiction in misdemeanors. For ten years we have had a psychological clinic attached to the court, presided over by a man trained in the clinics of Von Monikoff, Bleuler, and Kraepelin in Europe. We have in Chicago a large clinic. The Municipal Court in Chicago has as bailiffs all the members of the Police Department of the city. So that seventy-five hundred policemen act as agents in bringing into that laboratory those who do not conform to normal standards and who commit crime. My opportunities, therefore, of observation have been great, as we have the largest clinic of abnormal psychology in this country, if not the world. And we only sample that great population. We have not had a large enough staff to handle the cases that we should handle in a routine way.

We sample about twenty cases a day from the police courts. We specialized the courts, and have one for boys seventeen to twenty-one years of age. We have another for girls of the street, a Morals Court. For married people who cannot get along together, we have a Court of Domestic Relations, on the theory at the time it was instituted, that if one judge heard the family troubles of all the people of a great city for a week, six months, a year; maybe in the total of incidents we might find out what was the matter. We did not have to wait long until we found out that there were things the matter—psychological troubles, delusions of unfaithfulness on both sides. Many kinds of mental troubles lay at the bottom of family rows.

Those three courts are placed in the central building where easy access to the clinic can be had, and the criminal branches are scattered about the city, some fifteen in number, and they send those who are suspected by the judge or the prosecuting attorney to the clinic for examination.

When I went into the District Attorney's office, I had very little knowledge of psychology. My course had been that of a high school, where we had studied Haven's *Mental Philosophy*, a metaphysical psychology, where the writer told you about the workings of his own mind and thought he was interpreting the minds of all mankind. Well, we had a little more in the college, but it was about the same thing.

I went there with the traditional view of the layman, that is, with the view of crime commissions organized by our business men in this country; and I thought the criminal was what he was because he did not want to behave. Remember all my early life I attended Sunday school, and had been walking in the straight and narrow path. We punished the offender again and again and hung a few to set an example to terrorize the others.

I realized the futility of this when we had fourteen in the County Jail to be executed, and three boys came in as the result of a murder. The State's Attorney asked me if I would ask the Judge if he could not sentence these boys to life rather than to death. He said, "We have fourteen to hang in the next two weeks, and the flow of blood will be a spectacle which will shock the public." The judge sentenced those three boys to life imprisonment solely on those grounds.

We found out that we were not succeeding in preventing murders in spite of the hangings. I am not sentimental to an extreme, because I am reasonably hard-boiled. I have tried seven men to their deaths, and hundreds have been tried for murder in the course of my experience in the District Attorney's office. The case that brought to me the full realization that these murderers were defectives, was that of young Richard Ivens, who had killed Bessie Hollister, a choir leader in the Methodist Church. She was attacked upon the public streets at 6 o'clock in the evening, a wire put around her neck, and she was strangled. The young man was at the police station. Unfortunately, I let another attorney cross-examine the witness. With my own training in the criminal courts, there would not have been any leading questions such as proposed. Hugo Münsterberg of Harvard University telegraphed our Supreme Court where the case was pending for supersedeas that the youth was irresponsible and that his alleged confession was untruthful. Later Professor Münsterberg in his book *On the Witness Stand* claimed that the confession was false and that this youth was innocent. That was not true as I later informed Professor Münsterberg.

I ran my fingers through the boy's hair and looked at him in pity. I told the State's Attorney that the boy was feebleminded. He said, "I want to try this case and I want you to try it with caution and care. The father happened once to be a neighbor of mine. He is a fine American." I tried that case with great caution. I sought to lead the jury to a life imprisonment, but the jury executed him. When Hugo Münsterberg, of Harvard, telegraphed the Supreme Court, I thought it strange. We had alienists of our own who knew the right and wrong test. They claimed that he knew right from wrong, but the boy was suffering from dementia praecox, which was not known to the Chicago alienists at that time, and not known to the alienists of the world at that time. The Supreme Court denied the supersedeas and the boy was executed. When the mother appeared upon the stand, I took a hasty look, because I never cross-examined a mother trying to save her boy. She was not there long. I could trace the source of the mental defect.

Then when we organized the Municipal Court, I realized that we would have in the Boys Court many such cases. Watching these cases coming in constantly, for ten years, I noticed the physical and mental and moral deterioration of the "mine run" of cases. So I determined to open a psychological clinic.

The Northwestern University was holding the fiftieth anniversary of its Law School. They celebrated by organizing the American Institute of Criminology. They sent their Dr. Healey out to talk with the alienists of the country. Among others he met your Dr. Goddard, then of Vineland, N. J. He brought back from the alienists of the country and from Dr. Goddard their ideas as to what should be done. Soon thereafter we organized the laboratory we now have. The third report of the court published what we thought at that time should be done—the American Plan—and the later report of the court published what the European idea was in regard to these deficiencies.

Germany has been twenty years ahead of America in psychological and psychiatric studies. I could hardly believe it when Dr. Paton told me that, because I knew that we did better in surgery in the United States than they did in Europe. I knew we were nearly as good in internal medicine. I was not prepared for such great lagging behind in our country in psychology and psychiatry.

In talking with General Crowder during the war, who looked over the records of our Boys Court, he explained it to me. He said that for thirty years Germany had been building an army to fight the world. For thirty years she had been preparing. She had the youth of her land in cantonments and was training them from a year to two years. She called in the psychologists and alienists to find out why a youth with good intelligence yet has a counterfeit mind, and could not be depended upon in emergencies. Germany began to sift the human material. That is the reason he said he believed that Germany was so far ahead of other countries in this particular field. He said that this country could not afford not to do likewise. "We will call our cantonments educational, military, or what you will," he said, "but we are going to have experts take physical and mental inventory of our youth every year."

You know the shock to the public when we did take that inventory during the war in a desultory way. I looked over the records at Washington, and the alienists were not identifying the real trouble, the real basic trouble with many of those who were under suspicion. The alienists measured, the psychologists measured the intelligence, and the reports were on intelligence, but they said nothing about the real trouble, the defects of emotion-dementia praecox. In many cases, this is a defect of both the intellect and the emotion to which Dr. Bleuler, of Zurich, has given the name, "propfhebephrenia."

We have only begun in this field of the new psychology which means that the basic trouble causing bad behavior is not defective intellect alone but defective emotions. The intellect itself plays a minor part. It is the brain which man has developed latest in life. The older brain, the cerebellum, was the brain inherited from the animal kingdom of millions of years ago. It is older, and therefore there are probably less defects of that brain than of the intellectual brain. In other words, there are more people with sound emotional reactions than there are with high intelligence. It is a good thing that that is so, because that is the only reason why democracy, as we conceive it in this world, can exist. With a sound emotional reaction, you have sound morals. You can trust the moral instincts and judgments of a people more than you can trust their mental judgments. That is a fortunate thing for democracy.

Now, you say what is this basal ganglia? Well, when we began in Chicago to talk about the "basal ganglia" some of the alienists smiled. I can remember one I met at a banquet. He told me that I had better sit to one side of the open window, for, he said, "Your basal ganglia will be affected." He was sarcastic. Many of the members of the Juvenile Protective Society in Chicago organized by the women of Chicago have had great faith in environment as against heredity. The Juvenile Court was organized by a group of women who were concerned about the way the courts handled children. The Juvenile Court had its origin in Chicago. I was in Court when Judge Tuthil, the father of the Court, took a child upon his knee and talked with him. One of our philanthropic women employed Dr. William Healey, now of Boston, to examine the children's mentality. Nearly all of our social workers in Chicago were environmentalists and thought that by proper economic conditions, proper home environment, proper home training, we could deflect from criminal ways and the courts these children who came to the Juvenile Court.

With my longer experience with criminals and familiarity with experts in courts, I noticed that the professional expert who testified on the witness stand paid great attention to the state statute. He would say, "He knows right from wrong." This is the test of sanity in this and every state in the Union, but I noticed that men like Dr. Grinker and other men teaching in the colleges took a different attitude. They were not so sure about the accuracy of the right and wrong test. Some of them challenged it entirely.

I began to inquire into the subject. When we organized the Municipal Court I personally saw to it that forty-two sections of the law were changed. And so I took notice that the statute that I had stood before juries and held up as sacred as the Holy Bible was made by humans. The legal tests for insanity have not been questioned since 1840. They represent medical opinion of 1840. They are not the medical opinion of today. Hence, we see the great discrepancies that appear when experts take the witness stand.

Now, to return to the basal ganglia. When Von Monikoff began his studies of the basal ganglia, Dr. Hickson of our laboratory was a student with him. Professor Von Monikoff has invited the alienists of the country to come to Munich on May first next when he will lecture on that subject. When the experts took up the microscopic study of the basal ganglia, we began to study in Chicago its relation to crime. This brings me back to the "New Psychology" to which I referred a little while ago. You will pardon me if I am a little technical, and then we will go on to something more interesting.

THE NEW PSYCHOLOGY

The school has busied itself principally with the static, or the intelligence side of mental life, to an almost complete neglect of the dynamic, or emotional or affective side. The dynamic side is by far the more important, making up as it does easily eighty or ninety percent of our daily behavior. Comparing the mentality to a charge of a gun, we load the cartridge with bullets; that corresponds to the cramming the child gets in the school. The cap of the cartridge corresponds to the emotions.

The intellect is primarily centered in the cortex of the brain. The cortex and the intellect have been pretty well explored. The emotions and the physical substrata, the basal ganglia, are practically terra incognita. Well-balanced and well-rounded pedagogy should be just as interested in the one side of the brain and its reactions as in the other; in fact, they should be more interested if anything in the side that up to the present they have so consistently ignored.

The Psychopathic Laboratory, of the Municipal Court of Chicago, is without a doubt the largest clinic of abnormal psychology in the world. It is not surprising therefore that anyone properly trained in medicine, neurology, psychiatry, and psychology would stumble on to a certain amount of discoveries in this previously little explored field. One of the first things the Laboratory did was to recognize the important difference between the intellect and the affectivity, or emotions, as well as the fact that the intellect is primarily confined to the cortex of the brain, while the affectivity is primarily confined to the basal ganglia.

Studying mental defectives from the psychological approach as well as the neurological enables us to differentiate mental defects into the two great divisions, namely, dejective intellect and defective affectivity; and under the first division to subsume the following concepts: feeblemindedness, paresis, and senile dementia, and under the other general division to subsume affective defects under the three concepts of schizophrenia (dementia praecox), manic-depressive insanity, and epilepsy.

The Laboratory was also one of the first to emphasize and develop the approach to mental diseases through psychology. It was also one of the first to attack the criminal problem, psychologically, and to make the discovery that crime is primarily due to a defect of the affectivity which is located in the basal ganglia. It has also made quite a contribution to the hereditary and eugenical phases of the crime problem. In several of these fields, the Laboratory has had to stand alone and practically unsupported until more recent investigators have come along and are now confirming many of the findings of the Laboratory in a most unequivocal manner.

For instance, Dr. H. Steck of Switzerland in an article in the *Swiss Archives for Neurology and Psychiatry,* in an article called "Contribution to the Psychic Sequela of Encephalitis Lethargia" says:

> We have seen that the association test has permitted us to find analogies with the schizophrenia (dementia praecox) and with the epileptic syndrome, we have found in addition, katatonic symptoms

> which are correlated with injury to the basal ganglia; in fact, we are able to say today with Fraenkal, Dide, Guirano, Lafage and others, that the katatonic symptomatology is in direct connection with and concentrated in a neighborhood of the basal ganglia. This not only accounts for katatonic motor symptoms, but also a part of this psychic symptomatology of katatonic epilepsy.
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> Our observations as well as those of many others show that the psychic troubles consequent on an epidemic encephalitis are not of the nature of dementia but direct themselves to the affectivity. It appears here to concern itself with affective psychic troubles directly of an organic nature, and which are neither reactive nor secondary to the psychomotor. Staehelin has already attributed these affective disturbances to the basal ganglia.
>
> The principal aim of our study was to call attention to the analogy existing between the psychopathological syndromes already known which are limited to the basal ganglia, which are responsible in certain mental troubles for the retarded affectivity and association disturbances of the epileptics.

He also says that Minkowski maintains in a recent article that clinical psychiatry is confined to but three concepts within the domain of the endogenous psychoses, namely, manic-depressive insanity, dementia praecox, and epilepsy, and these are becoming to be recognized more and more as really qualities without transition of one from the other. Steck adds, it is just these three qualities more or less complete that we have found as the sequela of encephalitis lethargica (lesion of basal ganglia).

Now that is important, because when sleeping sickness leaves after-effects, just as sometimes scarlet fever does, conduct may follow similar to that found in epilepsy, manic-depressive insanity, and dementia praecox. Therefore, it is an acquired injury to that center of the brain, when these others are of an hereditary quality.

There has been progress made since I was a prosecutor. In the first place, Mendel's law of heredity was re-discovered in 1900. That law, as you know, was discovered by Mendel in 1865. Then followed Kraepelin's great discovery of dementia praecox, a defect of the emotions, and their large play in the activities and behavior of human beings. Then came the discovery of the chromosomes, those minute particles that contain the traits that we get by inheritance, forty-seven in the male, forty-eight in the female. Here we find the whole story of human conduct, potentially, as traits in the chromosomes.

We have in our laboratory two instruments that ought to be on the platform of every high-school auditorium. We have a machine illustrating Mendel's Law of Heredity. Shot represents individuals. That machine is so adjusted that the proportion of defectiveness that will occur in a certain mating pour down the grooves in the slot machine. We show it to the aldermen. Aldermen do not understand technical explanations, usually. So we show them how the shot runs, the defective on one side and the sound on the other. And the alderman says, "Well, is that where we get those criminals?" and vote appropriations for the laboratory.

Then we have another machine, called the chromosome machine, made by Dr. Laughlin, at Cold Springs Harbor. Here we have twenty-four spools in two stacks on a spindle, with a black line at the center of each spool. At one side the spool is marked F for father, on the other M for mother. That machine as it stands represents your and my heredity. That is as we really are. But if you turn one of the spools around and you change father to mother, the inheritance of the chromosome would have been of the father instead of the mother. The father may have been stingy and the mother generous. So is the child. Whichever way you turn the spool you have the inheritance of the traits. These machines illustrate the laws of heredity; we need not wait for heredity to teach them in experience.

Mrs. Britton from Hull House came to see me about the disorderly boys of the neighborhood. She said, "I want you to send an able, strong, and forceful judge to Maxwell St. Branch Court." "What's the matter?" She said that the foreign children had grown wild there. "They are going in and stealing the pipes out of the pipe organ. They are stealing the wire from the piano." I laughed. She said, "What are you laughing at?" "I am laughing at heredity overrunning environment at Hull House."

We have two schools of psychology in Chicago, one represented by Dr. Herman Adler, and the other by Dr. W. J. Hickson of the Municipal Court of Chicago. Dr. Hickson stands upon the rock of heredity and thinks that environment plays a minor part in behavior in comparison with heredity, and Dr. Adler from his writings seems to think the opposite. Environment furnishes the opportunity. Environment will discipline the character, but the fact of fundamental importance is heredity. And we now know it scientifically. We know it by the family history. We know it by the records of the brothers and sisters and those of the uncles and aunts.

The young man who was tried recently in Chicago, twenty-six years old, but mentally twelve years of age, who killed a little child with a hammer in an old, abandoned barn had a fact in his history that was not brought out on the witness stand; he had a relative for forty years in the Kalamazoo Insane Asylum. And that is one reason in a recent case that you have read about, why the family had a doctor take the family history and present it to the court—a hear-say statement as a fact. And when the plea of guilty was made, that family history was submitted. The highest priced alienist in the case refused to go on the witness stand unless he could go back into the family history of his own investigation and trace the traits in the chromosomes of the defendant. Now $1,337,000,000 of American money has been spent toward environmental objects. That has been given to that cause as against only about $50,000 for heredity. And heredity plays the great rôle in life.

Fortunately, every farmer, every stock raiser in this country knows the importance of heredity. I was shocked the other day—and you teachers need to be warned, because he is a psychologist come from Europe, because he has a big name, you need to be warned against statements from a man like Dr. Albert Adler of Vienna, a behaviorist psychologist. I talked with him about the coming to this country of Dr. Mjöen of Norway. "What does he talk about?" said Dr. Adler. "Heredity." "He is my enemy," said Dr. Adler. "What do you mean," I said. "I do not believe in heredity," he said. "Heredity is a superstition."

I said, "I wish you had time to go down to my farm. You would find Percheron horses. You would find as head of the herd of Holstein cattle, a descendant of 'Mercedes, the 37th,' as head of the hogs, a descendant of 'Orion Sensation.' Everything on the farm from the dogs up is registered. Why? Because I have to go down and get a little encouragement in looking at good stock once in a while after seeing as I see so much human neglect of the laws of heredity."

Many laymen, as well as psychologists, have thought and written upon the significance of the emotions, but the most striking thing that I came across in looking through literature for recognition of the importance of the ethical side of man I found in the address of Phillips Brooks over the body of Abraham Lincoln at Philadelphia, when it was being conveyed en route to Springfield, Illinois, for burial. He said:

> As to the moral and mental powers which distinguish him, all embraceable under the general description of clearness of truth, the most remarkable thing is the way in which they blend with one another, so that it is next to impossible to examine them in separation. A great many people have discussed very crudely whether Abraham Lincoln was an intelligent man or not, as if intellect were a thing always of the same sort, which you could precipitate from the other constituents of man's nature and weigh by itself, and compare by pounds and ounces in this man with another. The fact is, that in all the simplest characters that line between the mental and moral natures is always vague and indistinct. They run together, and in their best combinations you are unable to discriminate, in the wisdom which is their result, how much is moral and how much is intellectual. You are unable to tell whether in the wise acts and words which issue from such a life there is more of the righteousness that comes from a clear conscience or of the sagacity that comes of a clear brain. . . . Not one of all the multitudes who stood and looked up to him for direction with such loving and implicit trust can tell you today whether the wise judgments that he gave came most from a strong head or a sound heart. If you ask them they are puzzled. There are men as good as he, but they do bad things. There are men as intelligent as he, but they do foolish things. In him intelligence and goodness combined and made their best result of wisdom.

A sound intelligence and a sound emotion make a great brain; Lincoln had them both in a high degree. A statesman may have high intelligence and he may have low emotions. We find in some of our statesmen that they have not seen right from wrong, when the difference was as wide as the road, when you and I can see it if it is a hairline. They lacked that fine emotion which is essential to see the moral side. Therefore, we get moral defects sometimes in public office, in states' attorneys, in judges, in senators—I am not going to tell you how far we can go, for you know why in Ohio.

Now, Abraham Lincoln has been held up to the American school children as the product of environment. They have talked about the Kentucky forests, they have talked about the Indiana and the Illinois prairies. Why, the woods of Indiana and the prairies of Illinois only disciplined his character. He was what he was by reason of a great heredity. He was one of the best-bred Nordics that ever lived on this earth. When he was President, he corresponded with a pastor of the church at Norwich, England, according to what Mr. Henry B. Bale, an insurance lawyer in Chicago, told me. He said when a boy he lived in Norwich, England. He was a choir boy in St. Andrew's Episcopal Church until he was eleven years old. He said when he was there he never read the inscription on an elaborate bronze tablet under one of the windows of that church, but upon returning with his wife to visit the Norwich church he read it and he was struck with the name "Abraham Lincoln," who died in 1640. This Abraham Lincoln was a great man of the district. While Mr. Bale was reading the tablet, the janitor came up to him and said, "I found an old booklet in the basement written by a former pastor of this church, when your Abraham Lincoln was President of the United States."

Mr. Bale read the pamphlet, and noticed the correspondence between President Lincoln and the pastor. It seems that this Abraham Lincoln of the great monument that must have cost a large sum of money for those days, had three sons, Abraham, Mordecai, and Thomas. One of these sons came to America with the second trip of the Mayflower. The other one came a few years later. From that strain came our president. Descendants went to Pennsylvania and Virginia, and Thomas, the son of Abraham—all the same names: Thomas, Mordecai and Abraham—was the father of our Abraham Lincoln.

We know through the chromosomes that traits can miss a generation, can miss twenty-five generations, yet can come out at any time. This Abraham Lincoln of ours had a great ancestor in a man who was a dominant character of the region and of the century where he lived at Norwich, England. He was honored above all others. Our Lincoln's father was an important man down in Illinois. He was educated for those days and a pioneer community as shown by his reports of sales in court records. You must realize that a man in a pioneer community had not the opportunities that he might otherwise have had. Environment furnishes opportunities.

Our Abraham Lincoln was what he was by his breeding. That, the children should be told. Because this idea that Lincoln could come from scrub human stock is negatived by the fact that scrub stock cannot produce a Lincoln. It cannot, it never has, and never will, under the laws of heredity.

This same quality of emotional tenderness that Lincoln had is present even in a feeble-minded child, if his emotions are good. Many feeble-minded children have sound emotions, and that is why they are loveable, that is why they are more tractable, that is why they are more obedient, —many times more so than some normal children—because they have fine emotions.

I have a poem here written by an Oxford professor that illustrates in a feeble-minded child the fine emotions that Lincoln displayed in the Bixby letter, in the Second Inaugural. It is called "Rufus Prays":

In the darkening church
Where but a few had stayed,
At the Litany Desk
The Idiot knelt and prayed,

Rufus stunted, uncouth,
The one son of his mother,
"Eh, I'd sooner have Rufie,"
She said, "Than many another,

"E's so useful about the 'ouse
And so gentle as 'e can be;
And 'e gets up early o' mornin's
To make me a cup o' tea."

The formal evensong
Had passed over his head;
He sucked his thumb and squinted,
And dreamed, instead.

Now while the organ boomed,
To few who still were there,
At the Litany Desk
The Idiot made his prayer.

"Gawd bless Muther,
'N' make Rufie a good lad.
Take Rufie to Heaven,
'N' forgive him when he's bad,

" 'N' early morning's in Heaven
'E'll make Muther's tea.
'N' a cup for the Lord Jesus,
'N' a cup for Thee."

The teachers need to realize that feeble-minded children are sometimes capable of fine emotions. The press has used the word "moron," which means a mentality limited to about twelve years of age, to refer to the criminal type who have dementia praecox.

Now, you say, "What is dementia praecox? There are three fundamental characteristics. The first of these is sudden character changes. A youth from apparently having been a quiet boy, suddenly commits a crime. Take the case of Burch of Los Angeles. He was a graduate of Northwestern University. True he had delusions, but it requires intelligence to have delusions. He had dementia praecox, a defect of the basal ganglia of the brain. It was in the heredity of the youth, so we find it in these criminal types, sudden character changes. Split association processes is a second characteristic; the individual does not associate ideas. They have a list of words in the laboratory which they give those examined. They ask the patient to say the first thing that comes into his mind. By the divergence of the word that he answers from the idea that is given him we see that he does not correlate his ideas. Hence his defective thinking. That is one important characteristic of dementia praecox. Then these low-grade emotions that I have discussed is another. The third is the most important. You can see it in actual life. I will apply it in a few instances. I was down in Washington visiting a friend. He has two children, one five, the other three. The father said to me, "They are intelligent, but I am worried about whether their emotions are right."

"Can't you tell me?" I looked around to see if I could find some experiment. I noticed the boy loved his cat. I noticed an axe out in the entry-way. I took out a watch that rings the hours, minutes, and seconds chimes. I said to him, "Do you like that watch?" He looked at me with suspicion. He was too smart to believe that I was going to give him the watch. I rang it in his ear. "I will trade the watch for your cat," I said. I put it to him while the chimes were ringing to hurry him to a conclusion. He said, "All right." I gave him the watch. He gave me the cat.

I went out in the entry-way, picked up the axe, and started walking out. The father said, "Where are you going?" I said, "I am going out to the wood pile. This is my cat. I traded the watch for the cat. I am going to chop his head off." Do you know, I got clear to the door and that boy did not budge. I wondered honestly how I would get my watch back. I was soon rid of my worry, because the boy came bounding with the watch. He said, "Give me my cat. Give me my cat. Here's your watch." And so I gratefully took the watch and gave him the cat.

What had happened? Why, the emotional quality of that boy protected the life of the cat. He was young enough to think that I might cut the cat's head off. He did not propose to have any blood on his soul, even of the cat. There you have it! Kindness to animals! I suppose that trait can be developed. I remember another boy, who was three years of age when he came to America. I once saw him carrying a tom cat by the tail. He slammed its head against a stone foundation. Though only three years old he mastered the cat by cruelty. That boy since served time in the penitentiary.

Therefore, we find a great many of this type commit crime. I undertake to say that crimes of violence, what the lawyers call fundamental crimes, such as robbery, burglary, murder as a result of robbery and burglary and assaults upon women, are the acts of those who are both intellectually and emotionally defective. You will find all combinations or grades of feeble-mindedness and dementia praecox—that double defect. Of all the robbers and all the murderers I have seen, I have never seen one that I did not think answered that description. There may be a normal murderer, as a result of a quarrel, when a man kills another in hot blood; one may kill another in doubtful self-defense, and there may be occasional crimes when a normal boy gets mixed in bad company. The fundamental crimes of violence are committed by mental defectives.

The great McDougall, whom the English released to come here to take the place of Professor Münsterberg at Harvard, is a leading authority on heredity, psychiatry, and psychology. He has an article in the last *Forum* in which he calls attention to the great wave of crime throughout the United States. He says that crime runs parallel to mental deficiencies in the American population, and that is exactly true. That is the experience of the lawyer of long standing in the courts, so that we have here a neurological problem, as well as a criminal problem.

Can we handle it? Yes. We appeal to you school teachers. I think that the Juvenile Court, the Boys Court, and in lesser degree, the Criminal Court can be eliminated, when we can identify these defectives in the public schools, and remove them to protected farm colonies. Good psychiatrists can identify them when they are babies.

As I was coming into the court one day, a man said to me, "I am the son of the man who plastered your house." "What are you doing here?" said I. "This is my wife, and this is the baby we are going to adopt. That is the mother of the baby." Here was a mother giving up her child! I immediately suspected mental deficiency, and began to talk to her. "What is your father's business?" "He is dead." "What did he die of?" "He died in the insane asylum." "What is your husband's business?" "He's a dirty drunk, and in jail." Here was bad heredity on both sides of the child. So I looked at my friend. "You don't want a court paper. You come up with me to the laboratory." I took them up there. The child was defective. The doctor persuaded them not to adopt the child, and it was turned over to an infant asylum. The child gave the resistance of dementia praecox. He was obstinate, negative. The doctor by other means diagnosed that child as both feeble-minded and a dementia-praecox case, the type that is often executed in the big cities of the country in later years for murder.

Of the last twenty-one murderers in Chicago who were executed, everyone of that total was a defective type which the law did not consider or contemplate because science has outrun the law. One of them, Church, who killed Daugherty, the Packard salesman, and threw his body in the river and buried the body of Asmus, another salesman, beneath the garage floor, was a youth from Adams, Wisconsin. In order to obtain possession of a five thousand dollar Packard car, he lured one of these men into his basement, and a little later, the other. And he murdered them both. When he was tried he was conscious. After his trial he became unconscious and remained so for forty days. The jury decided that he was normal and knew the difference between right and wrong. The jail physician called in our doctor to see if he would live to be executed. He found him rigid and unconscious. The eyelids could not be opened unless pressure was applied. The body was rigid. His feet were cramped. The toes were each folded over the other toward the big toe, and held in such a cramp that it was next to impossible to move them the least bit. A match was drawn across his body, and the line would stay in the flesh and show for hours. He was a typical case of dementia katatonia with catalepsy, a common sight in the wards of large insane asylums. The authorities gave out that he came out of his stupor and said he was sorry he had done it, to appease the public conscience.

What should have been done? The schools of Adams, Wisconsin, ought to have identified that boy when young, and he should have been incarcerated in a segregated farm colony. The real solution of the crime question is preventive measures.

Another preventive measure is a proper marriage mating. Have we any regulation of marriage? No. Should we educate the young people? Yes. To know the importance of hereditary marriages. If we so taught in the high schools, we would have instead of the almighty dollar, the idea behind the contemplated marriage whether or not any of the relatives were in the insane asylum or in the feeble-minded institution or the penitentiary. Traits break out in any family, may come down as I say from the chromosomes as remote as twenty-five thousand years, or one hundred or fifty or twenty-five. They can appear at any time under the chromosome theory, so that an occasional defect is a burden of the race and not of a particular family. Possibly you realize that about 15 percent of those who are mentally defective, especially the feeble-minded, are such by injuries to the brain in early life and at birth. Every case is not an hereditary one. If you see the two types, you can quickly see the difference in their conduct and in their appearance.

A knowledge of the danger of a non-eugenical marriage is of utmost importance because the highest value in this world is a sound mind in a sound body. A sound mind in any kind of body is of course the next best asset in life. The soundness of the human stock makes for happiness, makes for success of this as well as the future generation.

If we look at the criminal statistics of our country we find how large the problem is. Take note of the fact that our asylums are being filled. In Illinois the asylums are full, the feeble-minded institutions are full, and we are building more. And do you realize that in Illinois now 25 percent of all our taxes go to the asylums, the feeble-minded institutions, and the charitable institutions? And if we add to that the cost of crime, half the entire taxes of the state of Illinois go to the mental-deficiency problem, and that is probably true of every state in the Union.

This large group of institutional cases is not the whole story. That is only a part of it. The twilight group, between daylight and dark constitutes as serious if not so pressing a problem. I do not think we need to institutionalize all the feeble-minded. I think some of them can live in the communities if they are kindly treated, if the normal children are taught to be kind. If a feeble-minded boy goes to school, the children all get around him shaming him to tears. "Crazy, crazy," they yell in derision at him. In Ireland they teach the children that bad luck will come to them if they make fun of a feeble-minded person. I went to Tangiers after a Chicago offender, and I noticed that everybody was kind to the insane and feeble-minded. I made up my mind if I ever was going crazy, I would go to Tangiers. Kindness to these unfortunate is a part of the Mohammedan religion. They are taught that a good spirit resides in all insane.

The other day at the election they killed a man in Chicago. He was a member of a family that had one member that was feeble-minded, another who was deaf and dumb. This boy who was killed was intelligent, but he had an emotional defect, and he began early to take money out of slot machines and to misbehave as a child. He grew up and became a bootlegger. A policeman killed him, and they had a magnificent $30,000 funeral, the newspapers said. The Chicago police should have taken the man in for disorderly conduct. After the trial, at which his true condition would have been disclosed, he would have been put in an institution.

I am often asked, "Don't you believe in hanging?" Well, I have told you what I have done. Jim Daugherty, a reporter of the *Tribune*, said, "Judge, I don't understand your position." I said, "I know one man I would like to see hung. You can guess who."

"Now," Jim Daugherty said to me, "What is your position?" I said, "Jim, are you married?" He said, "No." "You haven't a wife?" "No." I said, "We will assume you are married and have three sons. One of them is behind grade for age, is a defective and commits murder, and he is going to be sentenced to death. Let's go to the hanging of Jim Daugherty, Jr." Jim said, "I'm game." I said, "Jim, you can afford to be. There is no such boy or wife, but suppose it was a real fact." He said, "I do not understand your position. What objection have you to the hanging of my son?" I said, "I am the man he killed. That is why I object. I think society ought to have cared for your boy before he killed me. That is my theory. I do not care to be dead."

Before every murder trial we have a dead man. Let us save the dead men and get the murderer *before* he murders. That we can do by preventive measures. He should be picked up in the schools. You recognize the potential criminals, they are behind grade, obstinate, quarrelsome, and troublesome. They are the more serious problem children.

I once saw in the laboratory such a little boy. I tried to become friendly with him. He would not. Mrs. Hickson said, "Johnny, will you not please pick up the ball," referring to a ball that she had dropped near him. Finally he stooped under the table, and when he thought no one was looking, he kicked it further away. Negative. That is why I do not like to see negativism in some of our statesmen.

You see, that is a significant thing, because besides the defective we have people of high intelligence who have poor emotions and who are negative and pugnaciously retroactive. So we elect them to public office. In some of our cities, however, you only need an intelligence rating of eleven or twelve years to be eligible.

In one of our large cities a Congressman declared that the city needed no highbrow officials. In other words, mediocre intelligence, according to his idea was what was needed to guide important public affairs. Recent foreign immigration has settled principally in our cities and such an appeal was directed to that element of the population. Along with the sturdy stock we have taken into the country have come a considerable number of defective stock. The restriction of immigration of the defective type has been too long delayed in this country. Dr. Mjöen of Norway in a recent address in Chicago told of a defective from Poland who came to Denmark, married, and left six or eight children; went to Norway, married, and left several children. Proceeded to Sweden, married again and had several children. He returned to Denmark where proceedings were instituted to deport him. He was ordered to leave the country. One of the Danish newspapers ended an editorial protesting against such immigration by the statement "Denmark is at last rid of this undesirable citizen," but replied

Dr. Mjöen, Denmark is not rid of him. Denmark, Norway, and Sweden have twenty-five of his children mixed in their population to carry on through their defective heredity the damage this one man did to those countries. The significance of the blood stream in our national life is emphasized by such an example.

In the colonial times the hope for fulfilling the age-old dreams of philosophers, humanists, and statesmen of a new world founded on justice and the rights of man on a virgin continent constituted the dominant thought and impulse that selected from the European stocks those who would sacrifice and toil for ideals. Of such were many of the colonists, and to this fact alone is due the miracle of building the Republic.

For a long time thereafter migrating from the Old World to the New was a form of selection of the fit stocks of Europe, for those who chose to come were subjected to a perilous voyage lasting many weeks on the stormiest ocean in the world. Aside from the dangers of the sea the records show that there was a high percentage of mortality among immigrants, owing to the bad accommodations on the little, overcrowded ships. A great resolution was needed to embark on such a voyage—it meant cutting off forever all the old ties—trusting all to the opportunities of a new land.

How different this became with the advent of steamships, with short and relatively comfortable passage at very low rates. By that time America had become the traditional land of gold, of plenty, a place where everybody had a chance to get rich quickly. That was the main urge for leaving the motherland, not the lofty ideals and the sacrifices that drew the earlier immigrants and afforded a natural selection of the most daring and most idealistic.

In contrasting these two great impelling motives it must however be remembered that the older ideal did survive; and has endured to our times. Not all who have come to these shores in the later decades were prompted mainly by the get-rich-quick motive; but on the whole the contrast stands and is valid.

Today the immigration problem is merged in a greater problem, the age-old problem of human fecundity. We boast of the extension of life by modern science, of reduced mortality, and these are factors which supplement the natural capacity for increase of population wherever living conditions are favorable. In America in the near future, as in Europe during the nineteenth century, as in China for many centuries, as in India under British rule and as in Java under Dutch rule, we shall have increases in population compared with which the nineteenth-century trickle of immigration was a slight factor.

Sound immigration laws are necessary and will be, in order to keep the blood stream pure, but they are less important by far in the making of the future America than the matter of who, among those now on this continent, shall become parents of the countless millions to be born in the next few generations.

Wiggam has pointed out that one-fourth of each generation (which is one-eight of all people born) produces one-half of the next. In the next generation this half produces three-fourths of the next, and ninety-eight percent of the next, so that the quality of the original one-fourth, whether high or low, soon determines absolutely the quality of the whole.

Upon this factor depends the nation's future. A deep concern for that future must prompt us to effective measures of control. The task seems beyond us. And yet there are measures not difficult to take which will bring results in a generation. Among them are these things we can do. We can by appreciating the biological factors involved educate our young people to the importance of proper mating. We can restrict marriage so that the defective, the insane, and the criminal may not multiply. We can eliminate the criminal and the hereditary insane by segregating them in farm colonies and by sterilization, and thereby reduce our taxes one-half. We can deflect from the public schools dangerous defective types to protected and humane farm colonies before they come to the Juvenile and Criminal Courts. We can make the conservation of human resources the high aim of government and society. We can cease to make the individual the unit of society. We can make the family the true unit of society and by promoting racial hygiene increase the prestige and soundness of our nation.

In these directions, it seems to me, our attention must be given if we are to preserve and improve the quality of our national stock and thereby keep the American nation foremost in the family of nations. The future belongs to that nation which soonest and most effectively enforces a sound biological program.

To this cause we must give our allegiance. Private citizens of means, foresight, and love for their fellowmen are investing in education and research in biology, psychology, and psychiatry. We must promote general public information along these lines in order that wise legislation may be enacted, so that the unborn children of tomorrow may have a good inheritance. When the public understand the need and the possibilities, and realize that to a much greater extent than we have heretofore known human destiny is in human hands, they will further a biological program with a zeal that characterizes religion, and set an example in our country that will redeem the world from many of its greatest afflictions.

In order that a biological program such as outlined can succeed it is necessary for the dominant people to combine. The underbred are quick to do so. Some years ago I was advocating a Crime Prevention Bill before a certain legislature. Committees were invited to discuss the proposition before the legislative committee. Among them was a man with a conspicuous crop of hair and a negative disposition. He set out to attack my bill. He began by asking me to define dementia praecox, even before I had begun to talk before the committee. His associates requested him to desist, but I answered his question, adding that there were outward signs of this trouble, as well as inward signs. The inward signs were displayed when such an individual opposed, without reason, everything everybody else proposed. The outward signs, I stated, were sometimes displayed by mendicants in the streets of our large cities who wore long hair and carried signs upon their backs. They sometimes wear sombreros. Such a headgear is normal out West. It is acceptable at the Agricultural College at Ames, Iowa, where it is the prescribed headgear, but upon the streets of a large city where the wearer is the only one who has the headgear, to say the least, it attracts attention, and most people would think the individual a bit off. My opponent sat down and quit examining me. He opposed my bill but failed to defeat it. The bill was vetoed by the Governor. I came before the next session of the legislature—there was my opponent again, but he had his hair cut. "Where do you think you are going to get now with your bill?" I replied, "The bill that you opposed was adopted by the Belgian Legislature, it was adopted by the state of Massachusetts, also." He replied, "You didn't accomplish anything the last time you were down here." I said, "I certainly did, I got your hair cut." To this day that man keeps his hair short, though in his case long hair may not have meant anything, he was afraid that it did.

Above the lower grades, we have possibly ten million in population who should not exercise the franchise. Franchise should be taken from the criminal and mental defective. They are not equal to the task of determining whether or not our country should enter the League of Nations. We cannot submit to them matters involving the future of the nation. This group borderland, insane and criminal, constitutes the menace of the half-man. He must not be allowed to direct the future; he must not be allowed to multiply his kind. We must not permit him the privilege of contaminating the blood stream of the unborn children of tomorrow.

Some years ago when the late President Wilson was governor of New Jersey, he presided over the American Institute of Political Science at St. Louis. Five speakers were on the program from five states, and all had recently adopted the direct primary. All five favored the direct primary but all five agreed that it had brought inferior officials in their states. The foolish notion that the majority is always right has generally prevailed in this country. I think we must come to a representative government, the kind of government we had in colonial days, when this country produced great leaders. Under the convention system candidates for public office are scrutinized and the unfit are more apt to be eliminated than in a direct primary. The direct primary may work very well in the smaller community where the citizens know each other and each other's standing, but in large cities of the country, where that cannot be true, the direct primary is a failure. The judges of the courts of our large cities are constantly deteriorating in ability, education, experience, and quality.

Biology, psychiatry, and psychology are new sciences. They have hardly been considered sciences for more than forty years, while the physical sciences have behind them centuries of application. I have no doubt but what these modern sciences when applied to the human race will work greater changes in our civilization than has the physical sciences. Our educational system will be the first to be affected; not all those who apply to the college for admission should be admitted. Psychological tests will direct the youth in the lines which they should follow. This was illustrated by the experience of Rochester University School of Music. Dr. Rhese, the president, and Mr. Eastman, the benefactor of that university and the supporter of its musical school, insisted upon using the Seashore test for musical ability in testing all applicants. The entire faculty opposed, but Dr. Rhese and Mr. Eastman had their way. The tests were applied and at the end of the year a check-up was made of those who actually failed in the school with the psychological tests made at the beginning of the year. One hundred and forty-six had failed, and the one hundred and forty-six who failed were the ones who failed in the psychological tests. After this demonstration the faculty gave in and the psychological test for ability in music has become a permanent requirement at Rochester.

Industry will apply these tests. There certainly is need. A few years ago I sat upon a coroner's inquest in Chicago where a freight train had backed into a street car and killed ten people and injured thirty. The railway towerman looked suspicious to me, and I caused him to be examined by Dr. Hickson, who testified that he was nine years of age mentally and had dementia praecox in addition. He remained in the tower, notwithstanding the cries of the dying and wounded beneath. He had no emotional reaction toward their plight and no urge to help. This conduct of his, as well as his appearance, enabled me to identify him. It cost the railroad large sums in damages to have employed a mental defective in so important a position.

A large number of the injuries in factories are due to the sluggish mentality of those hurt. These modern sciences also affect our religion. Religion has been much concerned about the future life, but these sciences will direct it more and more toward the future of our race. Our responsibility to the race, to the unborn children of tomorrow, will be a larger and larger part of our religion. The human being of the future cannot have a better inheritance unless we begin now by the application of scientific laws. We are beginning to have a racial consciousness. The church will lead because its members are usually recruited among those who have the finer emotions. I look, therefore, for the church to lead in the eugenic reforms. We must give attention to the improvement of the race for another reason. Civilization can go forward while the human race can deteriorate at the same time. Civilization is the accumulation of the inventions and experiences from generation to generation and can go forward while human beings deteriorate. While human beings have been on this globe for a million years, civilization began only about thirty thousand years ago. Civilization is young and now with knowledge being extended by rapid means of communication, such as radio, human progress will proceed with greater rapidity than ever before. When the late President Harding spoke at the bier of the Unknown Soldier in Arlington Cemetery, Washington, one hundred thousand people sat under amplifiers; another one hundred thousand sat under amplifiers at the Presidio on the Pacific Coast. The people assembled on the Pacific Coast heard the President's address, as well as those who sat upon the Atlantic Coast. They heard the prayer of the chaplain, the dirge of the band, the salvo of the guns, and the reverberation of the guns against the Virginia Hills was heard against the Presidio. With such rapid communication all over the world, all minds of competence will be applied to any problem. Progress will also be accelerated by the accumulative discoveries of science and their application to life. It will be harder to live in the civilization of the future than it has been in the civilization of the past. A better mind is required to meet the emergencies of life and of the times. Then, too, the backward races of the world are adopting the ways of science and Western civilization. There are close to 1,500,000,000 colored races and only about 500,000,000 of the white race. The white race has held its own by control of the forces of science and by control of the sea. We need to conserve the white race, as well as to see to it that other races breed from their best, because we have to live in this world with them. The world is getting smaller and smaller. Industry and commerce are always on the lookout for capable brains, but that is not true in politics. If a great electrical apparatus were standing yonder and any one was invited to operate it, being told, however, if he pulled the wrong lever he would be killed, how many do you suppose would manipulate the levers? But if that apparatus was a voting machine, none of us would hesitate to go up and turn all the levers.

The half-man thinks he can run the government, and he can and will if we adopt a system of government that makes it easy for him to do so. You may think the eugenic program difficult and almost an impossible one. It is more popular to sing with Henley, "I am the master of my fate, I am the captain of my soul," than to follow the other doctrine, which is the true one—I am not the master of my fate, I am not the captain of my soul. None of us is responsible for our heredity. The best we can do is to study our inborn capacities and guide our lives along the indicated lines. Some men are selling ribbons who should be commanding armies; some would be great engineers who are selling life insurance. The schools did not find their capacities—environment and heredity need to be adjusted.

I have said that science is moving forward rapidly.

Science began with our discoveries in astronomy; with our finding out the length of a year and how the months roll around. Astronomy has gone so far that we can weigh the world, predict the coming of comets, measure the stars, millions of light years away. Now we know that Betelguese is three hundred and fifty thousand miles in diameter and that Antares is larger and Myra nearly as large, and that there are thousands of others like them.

When we contemplate that we are riding around on a world eight thousand miles in diameter, we begin to appreciate that we have taken ourselves too seriously. We thought that we were kings of the universe, that we were set apart from all other animals and had no relation to them whatever. Now, we are beginning to see that we are a part of all life. In contemplating these things, I have more respect for the bug I see in the road than I ever had before. Mendel's Law applies to him as well as to me. I feel the relationship and am impelled to say "Good morning." On the other hand, we must realize that the human mind has a marvelous reach, far beyond all other animals. Burns' little poem "To a Mouse" illustrates the difference between the animal and the human:

> Still thou are blest, compar'd wi' me!
> The present only toucheth thee:
> But, och! I backward cast my e'e
> On prospects drear!
> An' forward, tho I canna see,
> I guess an' fear!

So we are more than animals, but we have found that our world is only a small part of the great universe.

How closely we are associated with the universe is illustrated by the fact that the same chemical constituents are found in meteors that we already know on earth. When I was a high-school student in Illinois, I questioned the theory that the molecule was made up of a number of atoms, because it was the only statement in the book that was not explained. Now Milliken and other scientists have destroyed the atomic theory. They have demonstrated that the atom is made up of electrons and protons. The electrons revolve about the protons just as the earth revolves about the sun. Now we learn that the iron of the radiator, the glass of the window, the wood of the door, and the flesh of the hand are all composed of the same, electrons and protons. Their difference is accounted for by a different combination of electrons and protons, positive and negative electricity. Here we are approaching the unity of the universe, the one central control and origin, the mysterious movements of Almighty God. The mystery of the chromosome is as great as any other in the universe. We die, but if we have offspring the chromosome continues. In our case the spark of life has run back to the infinity of time. Chromosomes have immortality, provided we have offspring. The chromosomes of all the people of the world are so delicate and so small that they could be contained in the cupped hand. So many accidents can happen to these chromosomes prior to birth, at birth, in life, that the fact that we are here indicates that we are the dominant survivors of human life. We are the best specimens of the human race or we would not be here. Our parents and grandparents were dominants to be represented by us at our ages so we can take comfort that we are the flower of time.

We can take greater comfort when we know that human destiny can be affected by us; that we, who are now living, are responsible for the type of folks who shall people the next generation and the next. We hear much about the conservation of natural resources and little about the conservation of human resources. Conservation of human resources should be the high aim of government and society. Our public money should be spent upon normal and dominant children and not go almost exclusively to the defective types as is now the case. Of course, we should spend our money for the defectives and treat them with kindness and consideration, but since we can eliminate the great majority of them in the course of a generation or two, we have no right to continue them. The teachers are leaders who deal with human beings who have an interest in the race, who look toward the future and hence I make this eugenical appeal to them to keep the blood stream pure.

SECTIONAL MEETINGS

ART

J. R. Hopkins, *Ohio State University*, Presiding

THE MARIONETTE THEATER IN ART INSTRUCTION

Winifred H. Mills
Cleveland

The marionette theater has opened a new field to the art teacher and her pupils. It is an excellent means of stimulating scholarship, craftsmanship, and social relations and of increasing art vision. Why do children, when a marionette play is being planned, work week after week with untiring effort, each worker feeling that his particular genius is needed to bring success? How does the marionette work this spell? The answer is in kindling the pupil's imaginative sense, by giving him an opportunity to enter intimately into the life of all characters, of all times and all places, encouraging and developing his personality and deepening his experience of life. Work with the marionette stimulates the pupil's art sense and relates it to his creative imagination. Following these two steps the pupil is led to creative action and to research work for definite information. The pupil's ingenuity is stimulated, for the marionettes, scenery, properties, and stage must be planned and constructed. The final step brings about collaboration and cooperation.

In the very first lesson the class is introduced to the marionettes. The history of puppets is briefly sketched from ancient times in Egypt, China, India, Greece, and Italy down to the popular Rip Van Winkle of our own Tony Sarg. Slides help to make the lesson vivid. The last slide is scarcely off the screen when a clamor arises. Everyone wants to make a marionette and wants to begin at once. The English teacher comes, her mind sympathetically ready with suggestions. Stories are discussed eagerly, and the pupils choose the story they wish to dramatize. Incidents are selected for their dramatic appeal and because they make a dramatic unit. The range of the puppet's possibilities is not forgotten. Dramatic characters are analyzed by the pupils in order to bring out qualities of character and personal appearance. English and art in this work are so closely related that one hardly knows where the one begins and the other ends.

Groups are delegated to go to the historical museum for preliminary study, to the libraries, and to the art museum. Sketches and tracings are made of costumes, head dresses, shoes, armor, castles, furniture, musical instruments, or whatever the play may demand. Colors used in the dress of the period and designs used in the fabrics are noted. Several class lessons are given to the study of color and values. Analysis of color is further strengthened by the selection of materials.

A talk on the proportions of the human figure precedes the making of the marionettes and sketches and working patterns are drawn. Rules of composition are discussed before the stage settings are designed. Complete schemes are submitted and approved before the actual work is begun. As the work progresses, properties and scenery are made in the wood-work shop and the sheet-metal shop by pupils from the marionette class. Posters and programs are designed and then printed and the teacher of music gives her assistance.

The most interesting step in the production of any marionette play is in the training of the puppeteers. Naturally the first efforts here must be turned toward the understanding and adequate interpretation of lines and to skill in manipulation in order that the puppet may become an almost perfect means of artistic expression. The pupil's imagination, now expressing itself through his skillful fingers, begins to give that release of personality and escape from self-consciousness so desirable for the adolescent girl or boy.

In the Fairmount Junior High School, Cleveland, the ninth-year classes in art during the last six years have given the following marionette plays: Childhood of David Copperfield, dramatized from Charles Dickens' *David Copperfield;* Sigurd, the Volsung, using the verse of William Morris; The Knave of Hearts; Men of Iron, dramatized from Howard Pyle's book of that name; The Adventures of Alice, dramatized from Lewis Carroll's *Alice in Wonderland* and *Alice through the Looking-Glass;* and that brilliant ballet, Patrushka by Ivor Stravinsky. This last play showed the heights to which children can rise in artistic expression. The entire ballet was in pantomime, the puppeteers using the marionettes to interpret the music. Each marionette play was given several times in the school auditorium—afternoon and evening performance—and is later given for the children's entertainment Saturday afternoon at the Cleveland Museum of Art.

Educational benefits of the marionette are not limited to the adolescent, for in its simplified form it can be used with children in the primary and intermediate grades. When one considers the pupil's gain in knowledge, skill, artistic sense, and imagination, and then adds to these the benefits of social training which come through cooperation and the sharing of interests and responsibility, the educational value of the marionette is evident.

BIOLOGICAL SCIENCE

F. A. HITCHCOCK, *Ohio State University,* Presiding

SOME COMMON MISTAKES IN TEACHING BIOLOGY

R. J. SEYMOUR
Ohio State University

Assuming as a premise that "whatever is, is good" is probably the most fundamental and unconsciously made error to be found in the teaching of biology. Such an attitude toward the general problem in the study of living things is by no means confined to elementary teachers. It creeps subtly into the discussions between teachers and students in the more advanced courses of colleges and universities. The origin of such a habit of thought, for it is after all a state of mind, need not be discussed. Perhaps the line from Browning that "all's right with the world" might summarize the matter as well as prolonged discussion.

Whatever the reason, it too frequently happens that the teacher stretches both the truth and his imagination in the attempt to explain just what good purpose a certain organ or organism serves in the general scheme of life. Hence, the teacher seeks, and if quite ingenious often finds, a useful purpose for every living thing, whether it be a mosquito or a vermiform appendix. Such an idea carries the teacher farther astray when the classroom discussion centers about the everyday topic of diets and nutrition. How often have we heard that butter is used upon bread because bread is lacking in fat, that eggs are served upon toast because toast will supply the carbohydrate which is lacking in the egg? Granting that the result of both procedures is admirable, the fact remains nevertheless that the student is given an altogether erroneous conception of the whole problem of nutrition if he is permitted to believe that there is any such thing as instinctive direction in choice of proper food combinations. Animals less intelligent than man are credited with super-intelligence when students are led to believe that these animals unerringly choose only the useful and just as unerringly avoid the harmful despite the fact that dairy herds each spring are decimated by eating snake root and the tender sprouts of other poisonous plants.

An outgrowth of such ingrained ideas is the equally fallacious conception that activities of cells, organs, and even entire organisms are the result of some need or lack on the part of such aggregations of living protoplasm. Not uncommonly one hears a teacher state that the increase of heart action during exercise is caused by the need of more blood in the active muscles; that one breathes faster after a race because of the lack of oxygen; similar statements will occur to those who have been present during class discussions of biological problems. Unfortunately such misstatements have a germ of truth. If a student is permitted to explain that the rise of liquid in a soda straw is due to suction instead of the positive pressure exerted upon the surface of the liquid outside the straw, then is the teacher of biology justified in permitting this student to explain that inhalation is due to air being drawn in by the expanding lungs, instead of insisting upon the true explanation.

When one states that many untruths are taught in biology it does not follow that one speaks disparagingly of the teachers of such courses. A good advertiser realizes the fact that constant reiteration of a statement tends to make that statement be accepted as the truth. If one hears certain things stated as facts, when they are almost universally accepted as true, it is little wonder that the teacher presents to the student false ideas simply because it never occurred to that teacher to question the truth of the matter. In a most matter-of-fact manner such a teacher tells the students that nitrogen serves the useful function of diluting the air since a human would "live too fast" in an atmosphere of pure oxygen, that the pores of the skin are opened and closed by warmth and cold, that bathing is necessary that a free secretion of perspiration may rid the body of poisons, that the flow in the capillaries is slow because of the great friction present in those blood vessels, that proper ventilation is necessary to remove the "impure" air. Instances might be multiplied almost without number of such fallacious teaching, largely because the teacher never doubted that such things were to be taught as truths since they are almost universally believed to be true.

HOW THE CONTENT OF THE COURSE IN BIOLOGY MAY BE DETERMINED

Otis W. Caldwell
Lincoln School of Teachers College, Columbia University

The first speaker will be interested to know that in another talk today when I wished to make a suggestion concerning the contribution of biology to psychology, and desired to give a little introduction to John Fiske's great contribution to biological evolution in his statement of the real meaning of the prolonged infancy of the human race, I used exactly the illustration he used this afternoon in the same detail, and I procured it from the same source. We would not have used the wording so exactly without having taken it from the great writer, Dr. Vernon Kellogg.

How may we determine the content of the biology course? How have we determined it? is a question we should first raise, for anyone who is serious and thoughtful will not be guilty of saying that all the progress that has been made should be discarded. Many thoughtful people before us have done the best they could with biology teaching, and great progress has been made. Education is suffering now from those who say that our generation is the one that has found out how to do things, with little or no credit to the others who have preceded. We do not have intelligence enough to do again the whole thing unless we use that which has been done.

How has it been done? H. Newell Martin came to this country from abroad to teach human physiology at Johns Hopkins University. He was a great teacher who developed a course of instruction in human physiology which at that time was so far ahead of what had been going on elsewhere that it was an outpost of advance toward which the main lines were directed to move. It soon became evident that the elementary stretches of science teaching needed some of the organization and contribution which his course made possible. Upon request he wrote from his college outline a secondary-school outline. Will you get the two books sometime and look at them to see what occurred? Will you do the same thing for the textbooks in zoology, college and secondary school, for botany, college and secondary school and for all the other sciences?

One of the best illustrations is in the two texts by the great teacher of physiography, Professor Salisbury. Salisbury's college textbook in physiography was inimitably fine for college students. It was a course primarily for the sophomore year, although some Freshmen and Juniors took it. It was an elective for those who desired the subject. When this course was developed he was asked to prepare an outline for a high-school course. In general, such a course was usually required in the first year of the high schools in the Central States, and in the first year of the high schools in the Western States, and an elective course in the upper years of the high schools in the Eastern States.

Will you examine those books and find that every chapter in the college book reappears in the high-school book, and that the several chapters on the ocean in the college book reappear as a single chapter in the high-school book, with the subdivisions of the high-school chapter the same as the chapter headings in the college book? Will you note that about 85 percent of the maps of the high-school book are the same as those of the college book, but fewer in number; that the paragraphs of the high-school book are fewer but identical to those of the college book; that it was made by the scissors and paste method? Without speaking adversely of these books, I am speaking of the way the thing happened, when those who knew about the subject were asked to prepare the organization for high schools.

It would have been disastrous had those who did not know about the subject prepared the organization for the high school. We still have texts in science in the high school made by that method. The day is past when that method will serve.

What is the present situation? We have developed a sequence of sciences in this country which the most progressive states have adopted. Where there is a sequence in science teaching, the tests show the results from science teaching.

We have science departments which carry the departmental idea too far into the secondary school. Professor Seymour said he did not think much of teaching in the high school until his own boys were old enough to attend. We do learn a lot from our children. Another college teacher of biology once said, "I wish they would not teach biology in the high school. They just muss up my types." Professor Bessey, a teacher of botany in the University of Nebraska, once said that every high-school course in botany should begin with the one-celled plants and should end with the composital and should teach all it could between those two extremes. He thought the beginning and ending places were settled. There are many things settled that way that do not stay settled, because they have not been settled correctly.

I believe that education will progress much more rapidly if we have data to support what we say. If we are really going to be scientists in teaching, we must be scientific enough to present data with which to support our claims.

In a study of the place of science in the secondary school made by Professor Hunter, of Knox College, the numbers of pupils enrolled in science courses during each year of the four-year high school in 1908 and in 1923 were summarized. This information is reproduced in Figure 1.[1] The long black line in the first group represents the proportionate number of pupils who studied general science in the first year of the high school in 1923. There are people arguing whether general science is going to find a place as the first of the sequence. It has, for no science subject ever has

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[1] Hunter, George W. "The Place of Science in the Secondary School," *School Review*, 23:379, May, 1925.

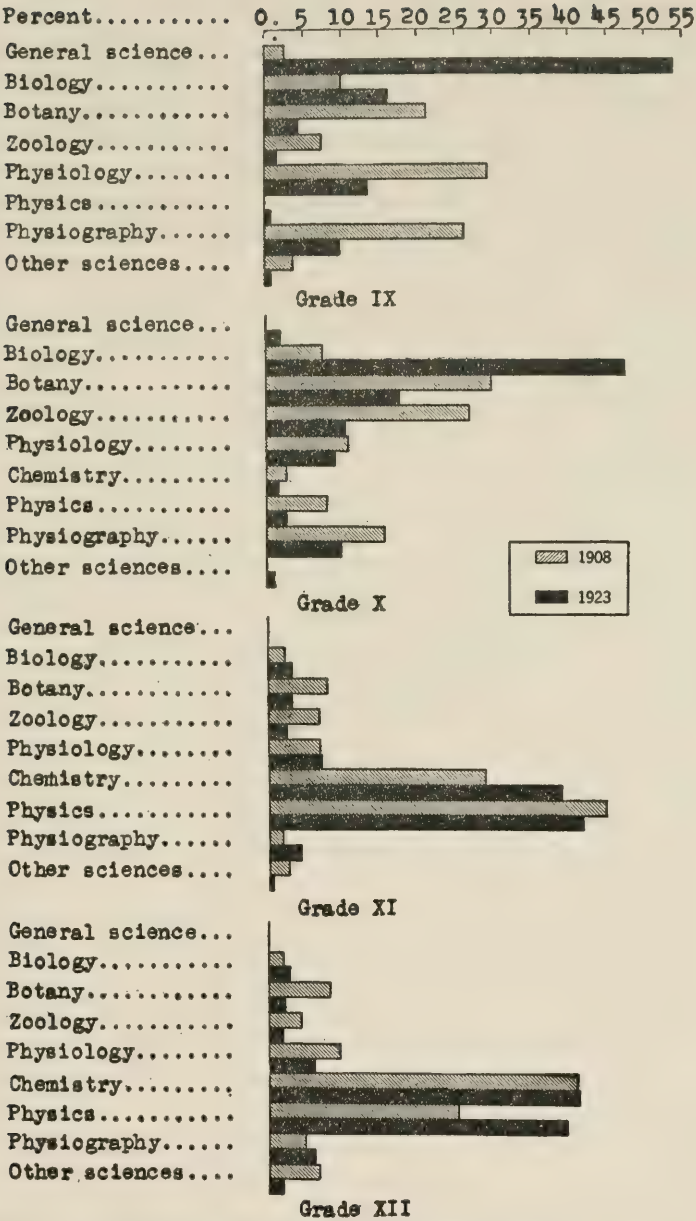

Figure 1.—Percentage Distribution of Science Courses in Each Year of the Four-year High School—1908-1923.

found such an extensive place. The long black line in the tenth-grade group represents the percentage of that grade enrolled in general biology during 1923. This exhibits results from representative schools in every state of the Union. In the third year, the two black lines represent the number of pupils who took physics and chemistry, as they also do in the fourth year. The sequence is not so definite in those years.

Fifteen years ago we were talking about what seemed likely to happen. The results are not far from what was anticipated in development of the science sequence. The one thing any science does is to enable us to see the course of events. Science does not have all the data on any problem, but if we are careful we can see the tendencies.

Dr. C. W. Finley in a recent publication entitled *Biology in the Secondary Schools and the Training of Biology Teachers*, has summarized studies made by seven students representing seven different situations. The same kinds of results appear from that study as from the two I have cited. Where is general biology now being taught and going to be taught? It is in the second year in four-year high schools.

I want next to discuss one of the criteria for trying to determine what the course ought to include. In my first instruction in biology the objective was different from the present objective. I started with the microscope to learn the details of cell structure. It seemed logical. Plants and animals are built of cells. To learn their structure it was natural that the start should be with the cell units of which they are built. Many things seem logical that are not psychological. Let me turn to an old illustration, one which I have used before, but which it appears must continue to be used until the psychology of that point is applied. While I was doing some work at Harvard with Professor Bergen, I saw an airplane for the first time. I came to the fairground just as the flyer rose for his flight.

What were the questions that came to my mind? This situation is applicable in science teaching. Did I wonder what kind of an ignition spark he used for the gasoline? Or whether he used hard or soft steel, or wrought iron for this or that? No, I thought: Man has made a machine that will fly through the air and will carry the man who made it. Those two big conceptions struck me then, and I have never been able to get away from them. As I saw the flyer that afternoon, I thought of the old statement, "You can no more do that than fly." Now man can fly.

After three or four hours of flying we observed that the crowd had dispersed. I had not until that time thought about what the thing was made of, or where the engine was placed to balance it. I began to answer the next series of questions, and every time thereafter that I have had an opportunity I have had pleasure in learning more of the details of an airplane.

Recently I found something about the structure of propellers. I did not know that the first cross-country flight would not have been made had the botanists not studied the details of wood fiber, and the mechanics studied them enough to know the angle at which the wood should be placed to strike the wind that it might wear long enough to make the flight. If a softer wood had been used, or if it had been placed so that the wearing had been the maximum that flight would not have been made.

Our science work considers details first. That is wrong. Psychologically we see big things first, and then work into the details. We should know these larger conceptions, and we can know them easier if we do not insist upon the details first.

Another guide to determine the course in the study of biology may be seen in the history of diphtheria in New York City. This city now has over four hundred thousand children immunized against diphtheria. Thirty-five years ago one-third of all persons who were infected with diphtheria died. Now less than one-twelfth of those who are infected die, and the number who are infected is much lower. By the Schick test and by the combination toxin-antitoxin treatment, immunization may be secured and thus the number of cases is reduced. You need not have diphtheria now if you do not want it.

In New York City last June a woman came into one of our leading hotels and developed smallpox. She made an arrangement with the attendants on the floor and the hospital management to permit her to stay in her room. Other cases spread from this unfortunate woman. The penalty of not having people know and do things biology would teach them to do is usually disastrous. Kansas City in 1921 had many unnecessary deaths from smallpox. Other cities have had similar misfortunes.

Years ago, when two little children were in the house, a maid contracted smallpox. When she served breakfast that morning, eruptions were noticed on her face. We called the physician and everyone was vaccinated. We had been studying a little science then. But the maid who did not believe in vaccination slipped out and went into her home. Her mother, brother, and sister contracted smallpox. Such is the penalty for not knowing and not doing.

Throughout this country are many people whose biological instruction, or whatever instruction they have had, does not lead them to carry over this type of science knowledge into a rationalized control of their lives. Until that has been done, there will not be adequate teaching of biology. That is one of the real functions of biology.

The community can or cannot have typhoid but the time will come when it is just as unrespectable to have typhoid as it is now to have the itch. Why, it has been so long since it was respectable to have the itch that there are people present who think I am almost crude when I use that illustration. In my boyhood days in the rural schools of Indiana we had the itch when children started to school. But we know a little about the biology of that situation now, and it has come under control, and it is not respectable to have it.

It is that sort of thing that biology must do. We have made great gain by putting knowledge into socialized, emotionalized, and volitionalized relationships. There will soon be a time when a community is in disgrace when it has typhoid. The time may possibly come when we can recover in the courts for having typhoid.

Other guides to what to teach are found in various events. In 1909 and 1910 broom corn was shipped to this country from Hungary and Italy. The United States Congress the other day voted to expend ten million dollars because the broom corn brought with it the European corn borer.

At Riverton, New Jersey, in 1915, some people found a peculiar beetle, which was later identified as the Japanese beetle. In one year it had extended so it covered half a square mile. And last summer, the first specimens were found on the campus of Columbia University. This Japanese beetle has extended now until it is in nearly all of New Jersey, southeastern Pennsylvania, all but the western arm of Maryland, and all of Delaware. Many boys and girls will not go to college in that country because of the beetle.

L. O. Howard, of the Bureau of Entomology, has said:

> It is not yet settled whether the human race is going to occupy the earth. The struggle for existence between man and the insects is just getting started. And the mass movement of insects is as yet successful, set against man's intelligence, for he has not used his intelligence enough.

In the study of these insects is one of the greatest demands for research and for extension of biological knowledge. You may say that is just New Jersey with its Japanese beetle, or Ontario, or Northern Ohio with the corn borer, or Colorado with the potato beetle, or the wheat rust of Minnesota, or the cattle tick of Texas.

The specialist says, "that is practical biology: do you want to practicalize the whole course?" The keenest thought of the human race is in solving its real problems. Whether the problem is practical is of little consequence. Great contributions have come sometimes over one road, sometimes over the other. I am talking about the problems of biology which are significant to the intellect, which are big enough to enable us to devote all our attention and energy to them.

The relationship between biology instruction and the value of human life is worth consideration. I have just picked up from the last number of the *Journal of Social Hygiene* an estimate made by one of the most competent life insurance statisticians in this country, Dr. Dublin, of the Statistical Department of the Metropolitan Life Insurance Company. "The High Cost of Children" is the title of this article:

> It costs about $7,238 to rear a child from and including birth to the age of eighteen years, according to the Metropolitan Life Insurance Company, which is making a series of studies on "the value of man" based on the approximate expenditures in dollars and cents for the growing child during the nonproductive period of life. This total is reached by adding to the initial "cost of being born," estimated at $250, the sums of $2,500 for food, $3,400 for clothing and shelter, $50 for education, minor items met by the individual family purse, $284 for health, $130 for recreation, $54 for insurance, and $570 for sundries. These figures are believed to be a fair representation of the money expended by a family, the father of which is in the $2,500 income class, in raising a child through its minority.
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> A pecuniary measure of rating the income value of the personal services of the mother and other members of the family is lacking. No distinction has been made for sex, because the difference in amounts for girls and boys is relatively small. Major items of education have been omitted because, according to the present system of public education, the parent here considered contributes comparatively little actual money toward the education of his children. Although he carries a share of the tax burdens in the rent he pays, etc., it cannot be determined even approximately just how much he actually spends in this direction.
>
> From the standpoint of the community certain additional costs must be considered owing to the fact that not all children born survive. In order actually to raise 88,264 children to age eighteen, the community must bear the cost of the birth and partial rearing of a full complement of one hundred thousand children. The computation which must be charged for this item of mortality gives the sum of $185 up to the age of eighteen. Also, considering the money expended on the child as being kept from an interest bearing investment, the additional cost to be added to the original figure of $7,238 for interest charges is $2,624. Thus the total expense, making the proper allowance for deaths and interest on capital, is $10,047.

That is as good an estimate as we have. Biology ought to help teach the value of life and afford some kind of relation to an interpretation of values of life which will correct part of the suicide movement which is going on around the country. I have secured the statistics on that for the last twelve years and up to the end of 1926—we do not know the facts fully for 1927—there has not been an increase in suicides of people between fifteen and nineteen years of age. There has been a decrease. The incomplete and defective reports that we now have do not indicate that we are going to have a higher than normal rate of suicide, but it may be true that people who have education have been committing suicide more than usual recently.

In my opinion the biology course may be made the foundation of a child's philosophy. I think we have been wrong in our teaching of biology often in not allowing it to give a little rein to the desire for a philosophical consideration of life that young people crave. My experience as a teacher indicates that at the age of the second or third year of high school, these children long for a discussion of the philosophy of life. If we deprive them, they get it in ways that lead them to wrong conclusions. The ablest teachers who have the best insight into child psychology are those who should work out some procedure by which we may contribute to an understanding of the real value of life.

Biology and thinking are what I have been talking about. Take the evolution craze that has gone around the country. Unless this audience is a very peculiar one there are some here who do not think it is right to teach evolution. Children are going to get at such facts as they can find. You cannot legislate them from it, and that is an unintelligent way of going about it.

The biology teacher on the other hand may say, "Yes, I shall teach evolution," then proceed by saying things of which he knows nothing, that is the real problem. The problem is not to get the privilege, but to find the right way to do it. More harm is done by the friends of biological teaching than by its enemies. Biology needs to be saved from the "unwisdom" of its friends. Numerous specific studies have been made that deal with the content of the course. The National Education report on the place of science in education sets health as the first objective. That is the one to which I have given most attention.

Two years ago a national organization asked that we find out just what now is being done in this matter of health instruction in science subjects as now taught. The experimental school of which I am a member agreed to finance a study of the health content of the science courses now available for the pupils in the school.

In the unpublished paper that has resulted from that study is an immense amount of factual information. The classification is that of the Gates-Strang study. There are four biology texts which have been studied, four physics texts, four chemistry texts, and four general-science texts. We have tried representative texts in each of these fields.

It will be surprising to know that in those texts 41 percent is given to health studies according to the classification, 36 percent of the second, 29 of the third, and 26 of the fourth. Then forty-five different health topics furnish the factual basis for the presentation of the health material. Such studies are going to enable us to know exactly what the situation now is in the courses as taught.

Dr. C. W. Finley and I some years ago decided that we would try to find out what biological information goes to the public through the daily press. We procured the month's issues of seventeen representative daily papers from all over the country. We studied every page of every paper, including the Sunday issues. We secured 3,061 articles that required biological information in order to be understood. Those articles were classified into eight divisions each with many subdivisions. The topic about which the newspaper presents the most biological material is health. The second is animal life; the third, plant life; and the fourth, food. The fifth is organizations of producers. The sixth is general-nature interest; the seventh, evolution; and the eighth, fictitious.

There were fourteen fictitious biological articles in these 3,061. That does not mean that everything said in all the other articles is exactly true. Some discussion as to the relative validity of different claims always occurs.

We published that study in a booklet of more than a hundred pages, giving the exact data concerning the information the public receives from the press. That does not prove just what should go into biology. It does not prove what is vitally necessary, or what the public wants. It simply shows what kind of biological information the public is now getting. By an analysis of what the public now receive, we find some indication as to what we may reasonably expect to have the public find of use.

May I close with this one reference to another service that the content must provide for—the æsthetic and interpretive side of biology. I think no person has a right to teach biology to the modern American youth without making the world more intellectually enjoyable to him. When one rides through the great Illinois wheat fields, and Ohio corn fields, he should sense the meaning of the chlorophyll that man has brought under control, which receives sunlight and does work under man's control, which it would not do alone. He should sense it as an example of man's intelligent improvement of nature. He should interpret it in terms of biology.

I think he should get from his courses in biology a notion of cause and effect. Things do not just happen. In this life things are caused. Results come from causes. There is nothing superior to biology for laying that foundation of proper understanding.

The pupil should understand that he has no right to gain biological knowledge without an accompanying social and moral sense of its proper use. One of the great dangers of this age is the increase of knowledge in people without the increase in their sense of the proper uses of knowledge. A chemical is now known which has not been made publicly available, a chemical which if in the possession of an evil-minded person would make it possible for one airplane flying over this city to drop it and destroy all life within the range of the city. If we had had that during the War, we could have murdered our enemies. But science will always result in war until there has been an accompanying sense of the moral responsibility for the growth of knowledge. That is another of the things that the biology course should help develop.

CITY SUPERINTENDENTS

MORNING SESSION

F. A. PROUT, *Superintendent of Schools, Sandusky,*
Presiding

INDIVIDUAL INSTRUCTION IN THE ELEMENTARY GRADES

MARY WARD
Rufus Putnam School, Athens

Individual instruction is not new, it is old. It is not a fad because it is based on sane psychological principles. It is not impossible for the Winnetka system is known far and near for its success. Individual instruction is being recognized as a step toward fine technique in teaching. Practically every new school text published today shows the writer to be a student of individual instruction. New texts indicate the trend of thinking in the educational field, for they are written because there is a need for help in the art of teaching. This need has come from the study of the human family.

Scientific study of the human family reveals two truths which seem to conflict when an attempt is made to form a standard code of behavior. This great family has characteristics common to all members. On the other hand each member has traits very different from those of his fellowmen. These truths are old ones. For ages leaders have sought to learn how to establish a code of behavior by which all men might live in peace and harmony but with each man free to develop his own individuality. This has been the task of education, since the beginning of life. Thousands of pages have been written to show how well the task has been done, and an equal number of pages have been written to show how inadequate the results have been. The truths remain as in the beginning, but science through research has given an enlarged view of them. The task of education remains the same, but science through research has enlarged the field and at the same time has placed finer tools in the hands of educators.

Each elementary school is a small section of the human family in which a code of behavior is being made that will serve to bring peace and harmony to the social group, but at the same time allow each member to develop his own individuality. It is to this task that each teacher should pledge loyalty when she enters the schoolroom. She is not alone with the task for the history of education shows successes and failures, and science brings knowledge of the human mind and human conduct. The problem that confronts her is a vital one because it is twofold. A little school family strives hard to be a social group and each of its members is individualistic. It is necessary that each member live a full, rich life as a child if he is to develop the traits of character that will enable him to render his best service to mankind. He must become familiar with a definite body of knowledge and at the same time build fine attitudes toward life with its multiplicity of interests. Every child has a right to feel the throb of success. It is through the feeling—"I am worth while, I am a success"—that real learning takes place. The close of each class hour in every elementary school should be marked with happy faces and and the anticipation of the work of the coming day. What are the criteria for judging a class hour? Each member of the group should be busy all the time with worth-while work. He should take a step forward, that is, he should complete a definite piece of work and be ready for more of the same kind, or something new. Each child should work from an inner urge and not from an outward push. He should be conscious of working for his own best good. Individual instruction fills a need which has long been felt. Each student has his own task to perform and when it is finished he undertakes new tasks. He is interested in beating his own record, hence works for his own best good.

The boys and girls of Grade IV, of Rufus Putnam School, have been interested in trying to beat their own records in arithmetic this year. In the fall budgets were given to each pupil. All started together, but as soon as one pupil finished a budget and took a test he was allowed to go to a piece of new work. All the combinations and processes of the third grade were reviewed, the three hundred and sixty short-division combinations were learned, and the division process was mastered through the "budget system." Now the spirit of cooperation is being developed in the room, when a weak pupil reaches a desired goal all the boys and girls applaud and he is as happy as though he were a member of the upper fourth. The strong pupils do not have a conceited notion of their success, for there is always a new thing to claim attention. Each child's achievement is compared with his former success, rather than with the successes or failures of the other members of his group. Thus each child becomes interested in taking his own step forward and works for his own best good. He works from an inner urge and is happy because he sees his progress. Any elementary teacher who desires to see the principles of a worth-while class hour functioning in her schoolroom during the arithmetic period can do so by individualizing the work.

INDIVIDUAL INSTRUCTION IN THE HIGH SCHOOL

Karl E. Whinnery
Principal, Sandusky High School

Plato said over twenty-two hundred years ago, "There is no greater inequality than equal treatment of unequals." In using this quotation reference is not made to wealth, birth, importance, or anything of that kind, but to the ability of different pupils in mastering a given subject. It is silly hypocrisy to assume that this ability is equal. Recent studies in education have shown how unbelievably great the difference can be. It is conservative to say that in our classes some pupils can do ten times as much as others. These are extreme cases, but differences always exist in varying degrees, and it is unfair and unjust to both slower and brighter pupils to expect the same amount of work from all. If a teacher bases his recitations on the ability of the brightest, all the rest get muddled, lose interest, and fail. If he directs it at the slowest, the rest are bored and become loafers. What usually happens is that the teacher teaches to those somewhat below the general average. The few below are ignored and lost, while those above coast and take things easy. This is not fair to either class.

The history of education shows that the great teachers have been teachers of individuals. The rapid growth of schools in the last fifty years has forced large organizations to handle large groups of pupils. The individual has been lost, and we are trying to find him again. Education has become a mechanical system, just so many hurdles to be taken. Everybody, regardless of ability, must take the same hurdles, so the emphasis has come to be placed on the system and not on individual development. Certain, so many high-school credits equal a diploma. There is too much of a tendency to get the credits with the greatest possible ease and to forget about an education.

Adapting work to the needs of the individual can be done and is being done in different ways in the school. One of these is by "the indeterminate assignment." Under this plan the pupils have definite amounts of work to do, and they proceed at their own speeds. Another plan is the contract, or unit plan, in which the teacher keeps the class together with a minimum essential assignment and requires extra work of those capable of doing it. One ridiculous objection was raised to this plan. It was thought unfair to require a pupil to do more work for the same credit. I suppose it would have been fairer to him to have allowed him to sit around in idleness. By such belief people sometimes miss the idea of education.

We hope to have our pupils realize that our school is to them an opportunity for the greatest possible individual development. To get this maximum individual development they must work to their capacity, and understand that the school is not just a system to be gone through with the least possible effort.

AFTERNOON SESSION

J. J. RICHESON, *Superintendent of Schools, Youngstown,* Presiding

THE INDIVIDUALISM OF INSTRUCTION

S. A. COURTIS
University of Michigan

Individualization never seems to be the same twice in succession because it is a movement toward an ideal. Sometimes it is a philosophy of education; another time it is a method of organizing instructional materials; and at other times and places it is a program for the administration of instruction. Today, I intend to discuss the subject from all three aspects and to try and bring some degree of unity out of the confusion. The cause of the present confusion is easily represented graphically if a vertical scale is constructed to represent the degree of conviction held by different types of people. Such a scale is presented in Table I. The various methods of individualizing instruction are nothing but concrete expressions of such convictions.

At the zero of the scale are those educators who have not yet discovered that children differ. Fortunately, such persons are few in number and are rapidly growing fewer, but in the old days it was taught that all children were inately stupid, evil, and plastic. The teacher held herself wholly responsible for the results secured. It was thought that if she only worked hard enough at her job of imparting knowledge the children would inevitably learn. Consequently, such teachers did not pay attention to individuals. Compulsory instruction of the mass was the rule.

The old education emphasized the acquisition of knowledge and skill as goals. It depended upon drill to fix habits and deliberately set out to make the new generation conform to the pattern of the old. It enforced its demands with "hickory sticks" and tolerated no individual variation. All through the Middle Ages the universal sign of a schoolmaster was a bundle of switches. As late as 1845, a survey of the Boston schools revealed that in an average school of four hundred children there were sixty-five floggings a day. Coercion of this type does not recognize individual differences.

TABLE I

SCALE FOR MEASUREMENT OF "CONVICTION REGARDING THE METHODS OF INDIVIDUAL INSTRUCTION"

Scale Elements	Step in the Scale	Scale Value
		100
Complete Socialization: In this one-way curriculum of life activities subject-matter is subordinate, completely individualized and used only as needed, e.g., the ideal	6	91.7
Two-Way Curriculum: The two phases of this curriculum are social activities, knowledges, and skills. Only the latter is individualized completely, e.g., Winnetka-Detroit	5	75
Complete Individualization: This scheme is characterized by a one-way subject-matter curriculum. Social activities are subordinate and complementary to subject-matter learning, e.g., Burk-Dalton Plan	4	58.3
Differentiated Curricula: Pupils are taught in X-Y-Z groups, and reliance is placed on differentiated curricula or methods	3	41.7
Ability Groupings: Reliance is placed on ability groupings. Within an age or grade the children are grouped in X, Y, and Z classes on basis of achievement or intelligence	2	25
Coaching Methods: Attention is given by regular or special teachers to certain children who have difficulty	1	8-3
		0[a]

[a] Zero is to mean just not any regard for, or attention to, the differences in children.

The time came, however, when parents were not willing to have their children flogged. The growth of the democratic spirit in society was at last felt in the schools. About the same time, also, psychologists adopted the methods of other scientists and began to study human nature by measurement. The outstanding contribution of the new psychology was the fact that children differ. Of course, everyone had always known that children differ, but no one had ever given any attention to the differences. The psychologists proved the differences were not only large, varied, and persistent, but that no large degree of success in training children could be achieved unless the training was adjusted to such differences in individuals. More important still, the efforts of the psychologists to measure human behavior soon led to better methods of measuring educational products. Teachers and superintendents began to measure the results of their efforts and were properly horrified by the revelations of inefficiency which came from measurement. They began to study children more closely and soon the conviction developed that in addition to the class instruction it was necessary to give special help to individuals, especially those who fell behind. Various plans of coaching by special teachers, and of special periods for giving individual assistance, appeared. Belief in the need for such assistance to individuals constitutes the first step in the individualistic scale.

By this time intelligent school men were not content merely to devise methods of solving the problem; they measured the effects of the solution adopted and so soon found that supplementing class instruction by special coaching assistance, while helpful, did not solve the problem. About this time, also, the intelligence test appeared, and ability grouping was proposed as a means of adjusting the work to the children. Tests were given and children were put into small groups of equal mental development, or equal mental achievement, and taught in smaller groups.

Measurement soon proved, however, that this method also was an inadequate remedy. Children selected as equals in development or ability did not remain equal. Each child proved to have his own rate of development and his own periods of acceleration and retardation. Moreover, the children on the average grew at the same rate whether they were in special groups or in mixed groups. This grouping benefited only the teacher who found it pleasanter and easier to teach a group of children selected as homogeneous in ability than to teach a widely divergent group. The teaching proved no more effective, and the administrative difficulties were greater.

The third step in individualization was the attempt to adjust not only the grouping of the children, but the course of study and methods of teaching as well. It is too early to tell what the ultimate results of this plan will be, but so far they are not promising. Administrative difficulties multiply in direct proportion to the number of adjustments to be made and any scheme of adjusting the instruction of groups soon breaks down because of its own complexity.

From the beginning, however, there have been men and women who have considered the problem and found a workable solution. Indeed a study of the "mountains of evidence" that children differ so completely in physical, mental, educational, and social capacities, experiences, achievements, and rates of growth that no adequate grouping is possible—that each individual is destined by nature to be a distinctive personality, different from all others—leads eventually to the conviction that no instruction in groups can possibly be adequately effective. The time comes when the conviction is born that each child must be allowed to grow in his own way, progress at his own rate, and move toward an individual goal.

As a teacher faces a group of forty active, restless children, she is sure to ask herself, "How is it administratively possible for the training to be adjusted in character, amount, time, conditions, and rate of progress, to the needs of each individual child." The answer is easy. It cannot be done—by the teacher—but that does not mean it cannot be done at all. It can be done very easily by taking the child into partnership, providing him with opportunities, and letting him choose in terms of his own nature and interests. That is the way the diverse and complex life of society is carried on, and experience proves this method is just as successful.

Fortunately, taking the children into partnership is acceptable socially. Our social life and our social ideals demand even greater individual freedom. Children and adults alike balk at unreasonable restraint and the change in our social philosophy is reflected in the new philosophy of education. Today, the progressive wing of the educational world frankly sets up integration of personality as its major objective and relegates the acquisition of knowledge and skill as a goal to the background. It sees education as development from within, and values creative activities more than those which merely result in conformity to the existing pattern. It welcomes the transfer of responsibility for growth from the teacher to the children. Such a transfer not only makes the adoption of individualized method easy, but also points the direction in which such individualization of instruction should move.

Credit for being the first person to achieve the conviction that complete individualization of instruction is necessary and desirable, and to take the necessary steps to achieve it, must be given to Preston Search, superintendent of schools in Pueblo, Colorado, 1888-94. However, he was ahead of his times, and the tangible results of his efforts were small.

The acknowledged founder of the movement for the complete individualization of instruction was Frederic Burk, of the San Francisco State Normal. About 1912, he actually individualized the whole program of his school, writing courses of study in the form of self-instruction booklets and devising administrative methods of use and promotion. These lessons may properly be called individualized subject-matter lessons. Apparently, socialized activities formed a very small part of Burk's curriculum.

Other individuals reached a similar conviction concerning the need and possibilities of complete individualization. For instance, the speaker in 1912 became convinced that no other scheme would meet the conditions, and independent of Burk worked out self-instructional materials for certain of the fundamental skills. His practice tests in reading, writing, and arithmetic embody many of the same devices used by Burk and are expressions of the same ideals. Miss

Parkhurst, originator of the Dalton Plan, represents still another development based on the same convictions. Miss Parkhurst stresses the characteristics of her plan of organization as freedom to work without interruptions in order to pursue an interest and to develop concentration; community living or the permitting of children to go from laboratory to laboratory, mingling and living, within the school, while engaged in school pursuits, just as the community outside of school lives and works; and budgeting time or the mapping out of the work for each individual in the form of jobs or contracts according to individual needs. Miss Parkhurst's plans have been copied throughout the world.

A well-known attempt to individualize instruction was made by Superintendent Washburne, of Winnetka. Washburne worked with Burk and has carried forward Burk's ideas. The Winnetka schools have a two-way curriculum. One half of the day is given to individualized work on the tool subjects involving the acquisition of knowledge and skill and the other half is devoted to socialized activities which provide for creative self-expression and for opportunity to participate as a contribution in group activities.

In such schools no grades exist, except for bookkeeping purposes and no recitations, which are periods of mutual torture for both teacher and student. Children work on their own initiative at various tasks from sheets arranged for self-instruction and self-correction. Each child works at a task until he masters it, progresses at his own rate, and works in his own way. No child ever fails nor skips a grade. Promotion is from task to task. In September he begins where he left off in June. What he does, he masters. Children of different native endowments complete different amounts and kinds of work and at graduation the school merely certifies to the development actually achieved. Yet the school as a whole deals with large masses of children under public-school conditions.

At the present time there are many schools in this and other countries following such individualized programs. Figures on costs in time and money compare favorably with results from other systems. Efficiency also is high. The system is not only applicable to the elementary school but to high schools and universities and is capable of universal application.

The highest step on the scale of individualization, the ideal which at present is out of reach because we do not know how to bring about such conditions, is a curriculum of life activities so representative of life in general that children passing through the school would receive a balanced and harmonious development and organization of all their powers. Moreover, the activities would be selected and administered to organize the powers of each child around worthy life ideals of his own choosing and make him a dynamic contributing member of a society whose dearest desire was human betterment.

Such a curriculum would consist of a series of large projects of purposeful activity, in the course of which various needs for the use of knowledge and skill would arise. These needs would be met by self-instructive, self-corrective individualized material, organized solely on the basis of meeting such needs and not in terms of subject-matter. For instance, a boy cannot make a kite after the pattern of a Chinese kite without reading about it. He can be stimulated to want to make a kite by seeing a moving picture of Chinese flying kites, but when he attempts to gain sufficiently precise knowledge to construct such kites for himself, he must read and in his reading must come upon strange words, strange facts, perhaps new problems in arithmetic, in English, and other subjects. The self-instructional material dealing with these difficulties, however, would be organized about building a Chinese kite. The child would never know them as arithmetic, English, geography, history, any more than his father, the banker, calls his daily work of banking reading, writing, arithmetic, geography, or history.

An ideal has its value as pointing the way to progress, but so many of us are still on the level of steps one, two, and three, that steps four and five on the scale will serve as sufficient ideals for many years to come.

The two-way curriculum with individualized subject-matter is within the reach of each of us. Of course, the change from present practice would have to be made slowly, a room or two at a time, until command over the new method was secured, but the important thing for every doubting Thomas to remember is that school after school is now deliberately putting itself through the transition period and what one school can do another can do also.

For those who are interested in at least considering such a change, a program may be outlined. The first item of such a program would be a thorough appraisal of the teacher's convictions about individual difference. How significant do you consider the differences in children? If you admit there are differences but believe any form of coaching, ability grouping, or differentiated curricula taught by mass methods will solve the problem, you are not ready to take up individualized work. You should give standard tests at the beginning and end of each term, find the gains or losses of each child, and study them until you are convinced that your present scheme is unsatisfactory. Many testers consider only averages and not individual scores. So long as a fifth-grade class in reading makes the average fifth-grade score, these testers are satisfied, although in that class may be children from the second-grade level to the high-school level of ability. So long as the group makes the average gain they are satisfied, in spite of the fact that from 30 to 40 percent of the individuals make the same scores at the end of the semester that they did at the beginning and in spite of the fact that only from 15 to 25 percent of the children really make reasonable gain. Education is a matter of individuals, not of averages, and anyone who studies the effects of mass instruction upon individuals will soon be convinced of the need for individualization. The new methods will not make every child grow equally, but they do make it possible for every child to grow because the child of second-grade ability who is in the sixth grade can by individualized instruction be given work so adjusted to his second-grade level that he has the pleasure of success and the whole school may be made happy and successful and may learn habits of success instead of habits of failure.

The program continues with the supposition that you, the teachers, are already, or will eventually become, convinced of the need for individualization. The next thing to do is to study. You can, of course, begin work at once and blunder your way through as the pioneers have done, but you can save yourself from many mistakes if you will profit by their experiences. The first book to study is the second part of the *Twenty-fourth Yearbook of the National Society for the Study of Education, Part II,* "Adapting the Schools to Individual Differences." In it you will find not only statements of principles and ideals but the measured results of many experiments which tell the story in unmistakable terms. Perhaps the most helpful thing in the book will be the annotated bibliography which will enable you to locate as much additional material as you need. You will want to study especially Burk's results, Search's statement, Miss Parkhurst's description of the Dalton Plan and Washburne's description of the work at Winnetka. Most of all you will need to formulate for yourself a series of guiding principles.[1] If possible, locate the school nearest to you that is using individualized instruction and arrange to visit it. Do not depend merely upon observation because we see only what we understand and are certain to misjudge what we do not understand. Therefore, have some person who believes in individualized instruction interpret the work for you and explain what each part means. Look for good and bad elements. Do not make the mistake of judging the merits of individualization by what you see in one school. It is probably growing toward an ideal and making mistakes just as you will do. Copy the good things and not the bad. It is best not to copy any one pattern. Your local situation will have elements in it that will call for certain adjustments. Get a clear idea of what you wish to achieve, then construct creatively your own plan and program.

The third step is action. Choose some one simple subject, such as spelling, some one class where teacher, children, and conditions are favorable, and try your plans for a limited period, on a given set of words. You will learn more from your experiences than in any other way. Close the experiment and take time for careful appraisal. Discuss your successes and failures with everyone who took part, including the children, and make plans for a new and better experiment. Repeat the process as often as necessary until you have achieved a sufficient degree of success to give you conviction, experience, and confidence. Then you are ready to consider any general reorganization.

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[1] *See* pages xii, 79-81, and 84-86. (Public School Publishing Company, Bloomington, Illinois)

The next part of this program depends upon so many factors that no set program can be formulated. If your schools can afford it, buy the individualized material on the market in reading, writing, arithmetic, English, geography, and algebra that suits your purpose. Examine what you buy carefully, however, because some publishers are unscrupulous enough to capitalize any new movement, and their material labelled "indivualized" has no other claim to such use. Many lesson sheets and textbooks have been carefully worked out on the individualized basis.

If you cannot afford this special material you can get along without it. Ordinary texts may be divided into unit lessons. The special instructions necessary may be written on the board, duplicated in the writing period, or by mimeograph. Real conviction that school work must be individualized will overcome obstacles in your case just as it has in others.

Above all, do not fail to measure the children before and after your trial of individualization. The danger in trying experiments is that we shall throw away the good we have, before we achieve the better we seek. Measurement will enable you to pursue an ideal and at the same time to "keep your feet on the ground."

Nothing that has been said should lead you to believe individualization is easy. It is not. One solves certain problems and meets others. Individualization requires more cooperation from teacher to teacher, and a higher type of teaching ability than other teaching. Pioneers never succeed when they are lazy.

Do not forget your own struggles toward conviction and the time required for conviction to develop. As a superintendent, have patience with your teachers when they do not at once accept your enthusiasm for the new plan. Give them a chance to pass through all the stages of curiosity, investigation, doubt, vision, and conviction that you, yourself, went through. Make haste slowly. Teachers' meetings, which are really courses in individualization, and other types of teacher-training activities, are of great benefit.

Individualization, it is said, will dehumanize education, eliminate the teacher, and make instruction mechanical. Nothing could be further from the truth. Could anything be more useless and mechanical than some of the teaching now found in schools? One supreme value of self-instruction lesson sheets is that they make the science and the art of the finest teachers available for all. When a group of teachers cooperate in the production of lesson sheets and have done the best writing of which they are collectively capable, they try the lessons on the children, and every defect immediately comes to light. If the lesson sheets are reconstructed, tried again, and modified, until they are perfectly adapted to the children, the resulting product is as much better than the extemporaneous explanations of any single teacher, however able, for cooperation excels individual effort. Moreover, in use, the individualized material operates to locate unerringly the precise difficulty of the child so that the teacher in passing from child to child may give the greatest of her intelligence and personality to each child at the precise point where he needs assistance. This is real teaching. Assigning lessons, preparing material, lecturing, and correcting papers, utilize personality in no effective way. Relief from wasteful drudgery and substitution of sharp-shooting, diagnostic assistance to children at points of proved difficulty, made possible by the use of individualized material, brings joy to the heart of every teacher. Individualization properly conducted releases, and does not restrict, the personality of the teacher.

Another foolish statement, born of clouded thinking, is that individualization is anti-social. There is no such thing as social learning; learning always takes place in individuals and individually. Many matters can only be learned in a social setting and the two-way curriculum provides for half a day of social activities and half a day of individualized activities. This paper does not discuss the organization of an activities curriculum because that is another story. The question involved is to decide which learnings should be socialized and which individualized. In general, all development of knowledge and skill should be individualized, all development of ideals and appreciations socialized. All things that can be precisely measured, such as handwriting, adding ability, and capitalization, should be individualized. All things that are social in nature, or where meaning arises from social usage, appreciation of literature and music, government, banking, contests, and dramatization should be socialized.

Children are sensible personalities. Their lives, like ours, are controlled by purposes. Individualization means giving the children a chance. Ideas of the meaning, value, and need for individual knowledge and skill should be generated by the social activities of the school, satisfied by the individualized work of the school, and given a chance to function immediately in the social activities from which the need was derived. Of course, if this functional interrelationship is not maintained the scheme will not be successful, but that will be due to poor administration, and not to a defect in the scheme itself.

The program of individualization now may be summarized. For half of the children's time provide a curriculum of social activities of recognized, intrinsic worth to the children as children; for the other half of the children's time provide for the development of the knowledge and skills essential to the carrying forward of the social activities.

Promote from achievement to achievement, have no failures, and train only in the habit of joyful success. Work for growth in vision, self-direction, self-appraisal, self-control, and ability to cooperate with others. Then growth in character and in perfect mastery of the knowledge and skill essential to the individual will inevitably follow.

CLINICAL PSYCHOLOGY

FRANKLIN CLARK WAGENHAL, *Ohio State University,*
Presiding

CLINICAL PSYCHOLOGY AND THE SCHOOLS

ZOE EMILY LEATHERMAN
Ohio State University

Pestalozzi, that great educational leader, expressed a vision of the importance of the individual, toward the fulfillment of which we are still striving, when he said, "The individuality of the pupil can be respected and cared for *even in mass education.*" It is only within the last decade that the great body of teachers and administrators have seriously endeavored to discover the means of putting into practice the words of this master-teacher. The development of more adequate measures of individual differences, combined with a renewed interest in the whole child as the problem of the school, has brought about a change of far-reaching importance. It is impossible to discuss "Expertness in Teaching," our Conference motto, without giving some attention to the individual who is to be the recipient of our efforts as teachers.

It is not the concern of this paper to consider mental testing as such. It is here assumed that the basis of all good understanding of the pupil is to be found in a series of psychometric measures of him, although the most complete determination of mental level is not sufficient data regarding any person. Clinical psychology is an application of tests, plus. This plus represents an evaluation of non-intellectual factors which influence conduct. Clinical psychology studies the individual child as an entirety. It believes, to quote Dr. I. S. Wile, "Children are neither good nor bad. They are adequately or inadequately adjusted to life relations, including the school system."

Separate phases of the program advocated for the schools by clinical psychology are carried out by a number of existing agencies, of which some thirty or more might be enumerated. Among these are dean of girls in high school, the child guidance clinic, visiting teacher, school nurse, school psychologist, medical inspection, special class, and the vocational and educational bureau.

What can the school do if the system is too small to admit of the establishment of special additional agencies for the carrying on of such activities as may seem advisable? What can the individual teacher do to aid the pupils in her own room, or in her classes? These are two questions of great practical importance and they concern all who are interested in increased expertness in handling the individual student's adjustment to education and to life.

A few practical suggestions may be listed. It should be remembered that the most important single factor in the problem is the teacher's own understanding of the principles underlying mental hygiene. As part of her professional training she should acquaint herself with the details of work undertaken in other schools and in the clinics. She should come to understand that (1) All activity is an effort to meet life and get its satisfaction and that these must be realized in reality, not in phantasy or misconduct. (2) All children should be treated as individuals and their personalities respected. (3) Behind each failing grade and each behavior-problem is a rational cause which in most cases can be remedied by rational treatment more effectively than by the old-time type of punishment. (4) Unadjustment is not maladjustment until the false solution becomes habitual. (5) Natural periods of unadjustment occur in all children's lives. Some of these are: entering school, changing from one grade to another, change of teachers, entering junior high school, entering high school, and entering college. The whole upheaval of adolescence presents the boy or girl with a series of unaccustomed situations in which maladjustments may occur.

Preventive measures which are suggested include:

1. Clinical study, including mental examinations.
2. Classification.
3. Observation of beginning conflict.
4. Autobiography of students.

5. Home visits.
6. Physical examinations.
7. Study of scholastic record.
8. Conference with teachers.
9. Adapted curriculum.
10. Adapted methods, including special classes.
11. Carefully selected type of teacher.
12. Health program.
13. Vacation program, and employment bureau.
14. Scholarships to aid needy students.
15. Relation of individual and school to outside agencies (social and religious).
16. Attendance supervision (not mere truant officers).

These measures are taken from a Master's Thesis written by Miss Edith Cuthbert. They have been found to be helpful in a large high school in Ohio and they may prove suggestive even though the entire series may not be practical in any given school.

THE USE OF OBJECTIVE TESTS IN DIAGNOSIS

J. B. Miner
University of Kentucky

In the discussions of clinicians, two trends of opinion are noticeable. On one hand are those who are inclined to place emphasis on objective-test records, who feel that otherwise a diagnosis is likely to become pretense and who ultimately approach an extreme position in which a kind of measurement madness makes them diagnose feeble-mindedness only on the basis of intelligence tests. Those who show the contrary tendency note the unreliability of tests and emphasize how tests are affected by emotional and social factors. They gloat over the large errors of prediction for any individual case. The extreme of this tendency is to abandon measurement for the insight of subconscious judgments. Its devotees may come to have unbounded faith in powers as clinical seers. By experience they appear to have attained a sort of delirium of diagnosis which is almost clairvoyant in its certainty and in its lack of scientific understanding.

Among the illustrations given of the difficulties encountered by measurement madness and diagnosis delirium, is the case, reported by Dr. Gardner Basset, of a young woman with an I.Q. of 67, who was pronounced feeble-minded by a test worshipper. She was supporting an invalid mother and two brothers by her wages of $45 a week in the orchards and canneries, a fact of no consequence to the measurement mad. Another case is cited of high tested intelligence, a son of college graduates, who I.Q. of 127 meant little in life since he had always been unable to meet social and vocational situations. One young woman was found to possess normal tested intelligence, but was so unstable she continually succumbed to ordinary social temptations and invented elaborate tales to further her escapades. On a run-away trip from an institution for feeble-minded she supported herself for several weeks in Chicago.

On the other hand certain cases have been reported which were illuminated by the test diagnosis. In one instance tests indicated the leader of a juvenile group who burglarized a grocery. All three culprits were below average intelligence but one was a year higher in mental level. Another example was of a dishwasher, brought into a clinic as a cripple, whose I.Q. of 120 opened up the opportunity to go to college. Such samples renew the caution that a diagnosis and plans for care must be based upon a total picture of the case. Medical examination, tests, school and family records including all pertinent facts of the person's history and the available opportunities for care, must all be harmonized in a reasonable recommendation.

Recent progress of scientific work in connection with diagnosis is toward supplementing the tools of the psychologist for diagnosis. He is no longer so badly handicapped as a physician would be who had only a single instrument to aid diagnosis. He does not depend solely on the clinical thermometer of an intelligence test. Rather accurately scaled educational tests, motor and performance tests are now available to discover special abilities. What is needed now for diagnosis seems to be not further attainment tests, but standardization of instruments for measuring emotional and volitional traits such as instability, perseverance, and suggestibility, with some indication of lower borderlines which indicate failure in life situations. Progress is being made in these sorts of measurements so that we may expect to have various diagnostic instruments as a check upon opinion and to fill in the picture of the personality.

A significant development in the preparation of such diagnostic tools has been made in the measurement of trustworthiness. The early work of Voelker in testing for trustworthiness has been developed by May and Hartshorne into a scale for measuring the tendency to cheat in classroom situations. Moreover, a group of such tests has been brought close to practical usefulness for indicating incorrigibility by Vernon M. Cady under the direction of Terman, Kelley, and Williams. For a group of 150 thirteen- and fourteen-year-old boys whose incorrigibility was judged with certainty by their teachers, he adapted and improved the early tests until he had a battery of five tests, accurately weighted by the best methods. The result was a series of objective measurements which had, when combined, a reliability of .75. Moreover, this series correlated .69 with the degree of incorrigibility of boys in this group. It also suggested a dangerous borderline for incorrigibility. Similar success in predicting intelligence with an intelligence test a few years ago would have delighted the pioneer clinicians.

In closing, warning is made against allowing a magnification of measurements to obscure the personal-history facts observed in the laboratory of life, and against allowing an infatuation with one's own powers of divination to interfere with the use of objective measurements for supplementing the picture of the individual. In particular, clinical workers are urged to join in further research directed toward the construction of better test instruments for the measurement of personality traits. The clinic for mental and behavior development has a more universal usefulness than a health clinic. It should not rest until its technique is as perfect as scientific methods can make it.

ANALYSIS OF PERSONALITY IN RELATION TO SCHOOL ADJUSTMENTS

BUFORD JOHNSON
Johns Hopkins University

A study of the mental life of the individual usually leads to the consideration of two major aspects—the intellectual and the emotional. Measurements have been made with greater precision in the field of intellectual processes than in the emotional. There is no actual separation of the two processes for consideration of one without a complication by the other, but for purposes of analysis emphasis upon a particular aspect is important. The emotional life is ordinarily understood to include all gradations of effects from simple feeling to major emotions as fear or anger. In the considerations of personality, tendencies to excitability and the adjustment of these tendencies in social relations play a prominent rôle. Personality is rarely defined, but is variously considered as individuality, emotionality, character, or a summation of all the traits and tendencies of the individual. It is usually implied that character is what a person really is; that individuality is determined by the outstanding difference from others, and that emotionality denotes tendencies to excitability.

The definition of personality as the stimulus-pattern formed by the integration of the reactions of the individual to which other living creatures respond according to their perceptions of this pattern, seems to differentiate it from these somewhat vague descriptions and to express the accepted meaning in practice. This does not assume that all the traits of an individual are manifest to others—that all his characteristics enter into the stimulus-pattern that he forms. In fact, some of these traits appear to one individual and not to another. The stimulus threshold of the observer determines the personality to which he reacts. Instead of being a dual personality—a Dr. Jekyll and Mr. Hyde—each individual is really a multiple personality; a personality multiplied as many times as there are observers. In turn the characteristics of the observer, at the moment, determine the type of personality manifested, hence the highly complicated processes involved in the analysis of one's personality.

The discrepancies in judgments of an individual by several appraisers is more readily understood. So frequently parents say to the teacher, "You do not know my child. He is so different at home." We may grant that they are honest and in turn we may say, "You do not know your child. He is so different at school." Formerly the teacher would say to the psychologist, "We have studied this child a long time and you cannot understand him from so brief an examination under somewhat artificial conditions." Now many teachers are clamoring for this aid in diagnosing the difficult child. However, they are often fairly content with the less troublesome pupil, who may be in greater need of understanding as later problems develop.

Life would be monotonous, uninteresting, and less productive if individuals were not chameleon-like, changing in outward characteristics as their backgrounds change. What is the hope, then, of making an analysis of this changing pattern? Of what value are such analyses to the teachers?

Psychological studies show that the human organism is in truth a creature of habits, but habits in different stages of formation. Rhythms of organic responses are established; habits of posture and movements, of feeling and thinking are formed. If an individual is observed over a period of time for frequencies of emotional responses, of intellectual responses, and of social reactions, a distribution is found similar to that of the frequencies of words in the individual's vocabulary. As a relatively small number of words function frequently in the speech of the individual, so a few types of responses function in the usual routine of life. Against these most frequent responses or standards of behavior, are numerous specific reactions to more unusual situations.

The most frequent personality of an individual, as displayed to us, is the one of which we tend to think when we are asked to judge an individual — it is considered the expression of his characteristic habits. The environment in which a given observer obtains his data for judging an individual determines to a great extent his appraisal of the personality. A highly intellectual child may be timid and awkward in social reactions and will then be considered a "dumbbell" by the social group; an agile, vivacious, and socially practiced child may be considered bright and influential; a timid, but sensitive child may have a veneer of emotional expression toward those not within his intimate circle, and he will be misjudged as lacking emotionality or depth of feeling. These combinations of traits into personality patterns may be illustrated by the following cases:

Case 1—A girl, four years old, an only child, born when the parents were of mature age, had played little with other children or in romping activities. She was somewhat slow in bodily movements and speech, and had few changes of facial expressions. Placed in an experimental school for young children, she was soon rated as mediocre and uninteresting. It was admitted that she could read well for her age, but as material for experimenting in the development of creative abilities, she was considered most unpromising, even when information of an I.Q. of 160 was given. The psychologists decided the contrary and she was given a chance. At the age of eight, she was a star in dramatics. She was singled out with approval by artists in painting, molding, and rhythmic dancing and was graded as original in manual arts of printing and woodwork. She held an excellent record in scholarship, and was liked by boys and girls. Quicker and more graceful in movements than on entering school, she was still somewhat unemotional in expression by inflection of tones and by changes in facial muscles. These voice and facial characteristics with somewhat commonplace features and coloring seemed to cause the casual observer or untrained observer to make a wrong appraisal of her intellectual and emotional assets.

Case 2—A girl of eighteen was quick in body movements, speech, and changes of facial expression. She had made use of dancing prowess for financial gains. She was eagerly sought as a member of a social group in first periods of acquaintance. Problems of social misconduct were frequent, and a psychological examination showed her to be mentally deficient—an intelligence quotient in the sixties—and lacking ability to inhibit impulses, or to adapt herself to complicated environmental conditions. Despite this analysis she was given an opportunity for a leadership program by a supervisor, who had taught and had studied mental testing—who could not believe, to quote, "that a girl so alert, so attractive, so skillful in dancing, could be unable to influence a group along definite lines." Failure, somewhat disastrous, soon followed and the mistake in appraisal by the supervisor was acknowledged to be due to the effect of the girl's personality during the first contacts.

It is evident that personality ratings are determined by outstanding features in the stimulus-pattern that the individual presents to the judges and that standards of appraisal are common to many judges. Just what elements in the total personality pattern are most effective cannot be stated yet. In the two cases cited, alertness and agility, especially as evidenced by posture changes, facial expression, and vocal reactions, seemed the determining factors. Studies of personality have been much concerned with ratings by self and others on character traits, but the integrating factors in the personality as a stimulus-pattern for others have not received adequate supply. Professor Dunlap, at the Johns Hopkins University, is now engaged upon a study of such integrating factors in facial expression under emotional stimulation. The results, so far, tend to show the dominance of the muscles about the mouth rather than about the eye in the determination of the judgment as to the particular emotion experienced. In the present stage of the study there is a suggestion that the mouth may dominate in the expression of emotions; the eye, in the expression of intellectual activities.

A report on "The Good Judge of Personality" by Adams at the last meeting of the American Psychological Association brought out the differences in characteristics of a good judge of self, and of a good judge of others. The one who rates himself to be somewhat like the pooled judgments of twenty others tends to be—not an introvert in popular parlance—but decidedly extroverted. He must be popular; socially inclined, cheerful, and optimistic; moderately alert mentally; and given to directing his observations toward others. The one who is a good judge of others is not noteworthy for mental quickness or profundity, but is unstable, undependable, uncourageous, and unsocial—an "introvert" of the worst kind. Since no one would desire such traits, this conclusion, if accepted, would militate against the development by teachers of ability in judging others through personality but might lead to the withholding of judgment.

We must not assume generalizations from such a study; for it involved character traits which were variously and vaguely defined, and its results showed that the individual was a poor judge. A pooling of ratings on twenty judges is necessary for a high degree of validity. The selection of these judges would also determine the validity of the results. It is important, however, to note the relationship between the judgment of another by the emotionally unstable individual and the judgments of this same person resulting from pooled results of twenty judges with reference to the basis for such judgments. Does the person whose reactions—whether undependable or fearful—are determined primarily by those of others, learn to react quickly to the changes in facial expression and bodily postures which are associated with emotional responses? Are these changes the elements upon which we tend to focus in observation of others? Would a change in focus of attention cause an integration of the elements into a different personality pattern as the reversal of stairway appears in perceptual responses? Could those elements that are highly prognostic of character traits be selected for the purpose of directing attention thereto in the estimation of character through personality?

It is certain that the social adjustments of the child during school days are determined in great part, by the attitudes of the teacher and the schoolmates and the parents, both toward his success in school subjects and toward his social reactions. These attitudes are frequently formed on the basis of the personality of the individual in the initial contacts which differ for the different groups of observers. How often have you known a child to be considered indifferent, lazy, stubborn, and unambitious by his teacher, but lovable, active, and cooperative by his schoolmates; and studious, ambitious, and timid by his parents? The great frequency in cases of school adjustments of the misinterpretations of indifference and stubbornness for sensitivity and timidity shows a woeful lack of ability on the part of teachers and parents to recognize the emotional traits of the child through the personality patterns. This may be illustrated by the following cases:

Case 3—A boy who made good adaptations in the kindergarten was characterized as timid, but well disposed, studious, and bright in the first two primary grades. He continued to excel in scholarship, but failed in social adaptations in the third grade. The teacher considered him too bright for this group, hence uninterested, and recommended skipping a grade. The boy did not want to go up with older boys and the mother, who was concerned primarily with his tendencies to become a special behavior problem, consulted a psychologist. Examination of the boy was not made at that time, and instead of skipping a grade his activities were diversified. Before the first semester of the next school year had passed, he was rated by the fourth-grade teacher as bright, but silly, queer, wilful, and irritating —a bad boy, who needed severe discipline. The mother considered him a bright, well-disposed, but a highly emotional, nervous child, who was full of fears which were aggravated by the teacher's attitude. The boys of his own age liked him but considered him queer in his interests and activities and not very good for sports. Younger boys liked to play with him. A psychological examination of the boy showed him to be highly intelligent, possessing an I.Q. of 140—but erratic in his behavior, because of conflicting tendencies that the three groups of observers—parent, teacher, playmates—failed to discern. The teacher's estimate was most erroneous. This boy wanted to behave decorously in school as an ordinary boy does, but he was fearful of the scolding. Characterization by the teacher as silly, because he knew he was silly and that he did not know how to help it. And why? This boy of ten, an only child, was being treated by his mother as a two-year old. He was bathed and dressed by mother, could not swim for fear of colds, he must not play rough or fight, as it was brutal. He could not cross streets alone or go to a camp until he was fifteen. Through all this, he was loyal and affectionate to his mother and was trying to shield her, and to protect himself from scorn by preventing others from knowing how he was molly-coddled. Of course, his behavior indicated conflicting tendencies to one accustomed to observe the manifestations. If the first failures in social adjustments could have been interpreted aright, by the teacher, or as sufficiently grave for psychological examination—not mere intelligence testing—he could have been redirected and maladjustments probably overcome.

Case 4—A girl of sixteen was falling behind in the work of her fourth year at high school and seemed indifferent to her work. She was outspoken in her opposition to going to college. These two facts distressed a teacher who could not understand why the girl who had been sane, wholesome, intelligent, and industrious was acting so queerly. The teacher feared she was becoming abnormal. The school companions considered her nice, but uninteresting and old-fashioned in her ideals and practices. These personality patterns, as reacted to, were not indicative of her thoughts and feelings during this period. She was desirous of being a modern girl, of being attractive to the boys, of rivaling her girl companions, of participating in their discussions of social practices, but boys thought she was unusual. She could not break through their judgments. She set about to become a different person by failing in work that she liked to do, and by giving up a college course that she really desired. The teacher succeeded in having a brief analysis of the case made by a psychologist which resulted in the above mentioned facts and in the redirection of interest toward college, but provision was made for a new temporary environment that offered socializing opportunities. Certain companions and aids seemed satisfactory.

The practice today in a few schools of having psychologists analyze the factors involved in individual problems of school adjustment has led to the recognition of the need for more adequate methods of interpreting personality. The psychologist may take it as a clue and by diligent seeking, ferret out the characteristic tendencies, and abilities of the individual. Fairly reliable measures may be obtained for many of the abilities of the individual. These are essential for satisfactory social adjustments. The instruments that have been designed to measure character reactions in social situations are not peculiarly adapted to the study of personality, especially as used. Those who designed them agree that their primary function is suggestive for follow-up, rather than determinative. The direction in which one goes for further data should be determined, not by the quantitative score on the yes-no questionnaire—on the affectivity scale of rating associational trends, or by the qualitative score from pooled judgments. The clues to follow are given by the analysis of the elements that compose these scores.

All the experiences which the human has at birth doubtless affect the personality of a given moment, but the effect upon the observer of many of these experiences is negligible. The trained observer sees, or fails to see, that for which he is trained to look: the physiognomist, a protruding chin; the endocrinologist, a peculiar skin color, or body build; the neurologist, a biting of the lip or tremor; the sales manager, a self-conscious or aggressive manner. No short and easy method of evaluating the complicated traits and potentialities of the individual should be expected. It is fortunate if the clinical psychologist of today says, Let us take the longer, but more safely analytical method; let us refuse to make a definite rating upon indefinite data; let us use objective methods that are available for determining what the individual traits are; and also available criteria for validating our results; let us study more zealously the elements of the personality-pattern upon which one tends to base his estimates and the elements upon which one should focus for reliable prognosis of character traits. From such studies will follow methods of securing better judgments of the individual tendencies by the teachers and those responsible for the guidance of youth.

COMMERCIAL EDUCATION

I. R. GARBUTT, *Director, Commercial Education, Cincinnati,* Presiding

REALIZING THE EDUCATIONAL POSSIBILITIES OF COMMERCIAL EDUCATION

PAUL S. LOMAX
School of Education, New York University

In the program of studies of the public high school commercial subjects have come to occupy a place second only to English according to George S. Counts who writes:

> The commercial curriculum is the only one of the many different vocational curriculums introduced into the high school which may be said to have thrived. Its popularity is probably to be explained by the growth of a complex commercial civilization which requires a large amount of clerical service, and by the changing status of woman, which has cut many bonds holding her in the home.[1]

Statistics show, furthermore, that the enrollment of the public schools of the United States in 1923-24 was 3,307,250 [2] pupils of which 16.4 percent were enrolled in the commercial curriculum, as compared with 13.4 percent in 1918 and 5.3 percent in 1893.[3]

It is apparent from these statistics that commercial education has had a remarkable growth. Is it a growth that bespeaks educational stability? What is the future of commercial education? Will it, and should it, continue to hold a position second only to English? What is the legitimate place of commercial education in the public educational system? To what degree are commercial teachers prepared to realize the real educational possibilities of commercial education? Upon what solid educational foundations should commercial teachers build and reconstruct commercial education so that it will enduringly and effectively fit into the whole field of secondary and higher education and into our modern complex business life?

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[1] Counts, George S. *The Senior High-School Curriculum.* Chicago, University of Chicago, School of Education, 1926. p. 92. (Supplementary Educational Monograph No. 29)

[2] *Statistics of Public High Schools,* 1923-24. Washington, D. C., Government Printing Office, 1926. p. 2. U. S. Bureau of Education Bulletin, 1925, No. 40.

[3] Lyon, Leverett S. *Education for Business.* Chicago, University of Chicago Press, 1922. p. 7.

The groundwork upon which every commercial teacher should be prepared to build a commercial education of lasting and superior value in the learnings of his students includes a philosophical, psychological, sociological, economic, and scientific foundation of commercial education. This brief discussion of such an educational foundation assumes that the teachers are well prepared in the subject-matter of commercial education and that they have had a significant business experience.

PHILOSOPHICAL FOUNDATION OF COMMERCIAL EDUCATION

What should be the philosophy of business life? Should business be considered a dynamic, evolutionary social institution in the same sense as the home, church, and state? Lyon contends that "business is that system of economic organization to which in great measure is intrusted the all-important social task of utilizing our social resources, to secure for society whatever society secures."[4] These social resources are natural resources, labor power, capital, and acquired knowledge. Will the American civilization which will be developed during the succeeding centuries be fundamentally conditioned by the way business organization utilizes social resources? Is the road to culture—that which typifies the best of our social institutions and practice—the straight and narrow road of economic justice and prosperity? Is Filene right when he declares that good business policies must be good social policies? The great goal of business effort should not be merely to make money as an end in itself, but to realize through the means of money-making the best social-economic services in keeping with best American ideals.

In considering the philosophy of our business life a question arises concerning the philosophy of commercial education. Does commercial education in itself represent a complete education or does it simply represent one important part of a complete education which should be given to thousands of American boys and girls who are enrolled in the commercial curriculum? Commercial education has strength in active business life only when it is properly integrated, wisely unified, with a useful kind of so-called academic or general education—English, mathematics, social science, natural science, health education. Commercial education and academic education are complementary, not antagonistic, and each constitutes the strength of the other in the total well-rounded education of commercial students.

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[4] Lyon, *Op. cit.*, p. 38.

PSYCHOLOGICAL FOUNDATION OF COMMERCIAL EDUCATION

Commercial education in its various divisions of subject-matter and its methods of instruction must be within the native learning capacity and life experiencing capacity of commercial students. The students must fill the need in terms of their present living realities if they are to be in a state of readiness to learn. To what extent do bookkeeping teachers, for example, who have taken courses in accounting at college and who perhaps are also practicing accounting, tend to treat high-school students as "miniature adults" and hence compel them to study complex bookkeeping topics and problems far beyond their appreciation, understanding, and life experiences? To what extent is the subject-matter of commercial subjects, in that it is not within the native learning capacity and experiencing capacity of students, serving as excellent instructional material for preparing learning failures instead of learning successes? Are learning failures liabilities to students and to teachers? As public high-school education becomes the common school education of all American boys and girls who represent all levels of learning ability, must commercial education be so constituted and taught that all levels of learning ability may succeed with it? Are not all levels of learning ability succeeding in business life? Should this not be possible also in the commercial education of school life? Here is a great need and opportunity for painstaking and extensive research to reconstruct commercial education and place it securely on the psychological foundation.

SOCIOLOGICAL FOUNDATION OF COMMERCIAL EDUCATION

One primary test of the educational value of commercial education is the use commercial students, as members of business life, can make of the knowledges, skills, attitudes, and appreciations which they have learned in the classroom. The sociological criterion of the worth of what children learn in commercial classes is the extent to which the things learned are "directly and immediately applicable in certain phases of active life." As Superintendent Condon stated "the test of the success of education lies not so much in imparting knowledge on the subject at hand, as in its power to enkindle the spirit of the student to apply it to life here and now through the interpretation of the teacher. . . . In the end, everything that is taught must be related to life, and must be applied to life here and now, and not contemplated for the future."

It is through the realization of direct values of commercial subjects that the learning of students becomes socially significant to them, to business, and to all life. To what extent is the subject-matter of commercial subjects characterized by direct values that are "directly and immediately applicable" in the business experiences of secondary-school students as they are living their activities here and now? Cox has well stated the principle:

> To teach pupils to do more effectively those desirable activities that they are doing anyway, is the most important single task of the school; first, because what they learn now to do well or poorly determines what they will do throughout life far more certainly than any learning for later activity can do; and second, because self-activity in modifying behavior, ideals, and knowledge can be stimulated and directed best if the outcomes are immediate.[5]

Here is a second great need and opportunity for painstaking and extensive research to reconstruct commercial education and place it squarely on the sociological foundation.

ECONOMIC FOUNDATION OF COMMERCIAL EDUCATION

What is commercial education? In the last analysis it represents a program of economic education which involves the following groups of life activities: those that seek to promote greater efficiency in the production, the equitable distribution, and the consumption of socially useful goods and services; those which seek to foster the conservation of basic material resources which condition the social-economic well-being of all the people; those which seek to humanize business organization so that the individual members of business life may realize fullest self-development consistent with best social well-being; and to instill in all members of business organization the ideal of "social service" as the working standard and purpose of all business activities. Business efficiency should result in human happiness and social progress.[6]

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[5] Cox, Philip W. L. *Curriculum-Adjustment in the Secondary School.* Philadelphia, J. B. Lippincott Company, 1925. p. 177.

These six primary elements of a program of economic education may be illustrated in any commercial class, which may be considered a unit of the business organization of the school. In considering a bookkeeping class, should not the teaching activities lead to greater efficiency in the production of learning results on the part of the students? Should not the teacher's efforts be so distributed among the different levels of student ability that both the poorer ability and the better ability students will experience best the learning results? Should not the teaching activities be so conducted that the students will learn to exercise thrift in the consumption of teaching services and school materials? Should not the students in their learning be lead to conserve classroom teaching equipment, textbooks, bookkeeping paper, and the general school plant which condition the well-being of all teaching efforts? Should not the teacher seek to humanize the class organization that the students, rather than the subject of bookkeeping, form the pivot of all teaching efforts—with human values therefore transcending subject values? Should not the bookkeeping teacher endeavor to instill in the students the ideal that the purpose of business organization is not merely to make money but a means by which money-making will justify itself by rendering social services?

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[6] Chapman, J. C. and Counts, G. S. *Principles of Education.* New York, Houghton Mifflin Company, 1924. p. 243.

SCIENTIFIC FOUNDATION OF COMMERCIAL EDUCATION

It has been said that true progress can come only when ways and means of finding facts and measuring results are devised.[7] Commercial teachers should learn to use the method of educational research so that the educational worth of commercial education may be demonstrated by means of scientific data. It would be difficult to prove the educational values of a single commercial subject, in any adequate degree, on the basis of data that have been scientifically collected and evaluated. We are still guided mostly by opinion in our organization and management of commercial education. This is no longer true among the better business concerns which seek to develop and manage their enterprises upon the basis of scientific data. The same practice should be followed in commercial education, for only by this procedure shall we be able to realize in an intelligent and convincing way the educational possibilities of commercial education in terms of its psychological, sociological, and economic foundations. In the opinion of W. L. Philip Cox "one of the most persistent criticisms of education as a science is that it is based too largely on speculative philosophy. The stage in the development in which education is a matter of opinion . . . where one man's opinion is considered as good as another's . . . is rapidly passing."[8] It will be succeeded by a new stage which will be the method of educational research.

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[7] Cox, Philip W. L. and others. *An Outline of Methods of Research and Suggestions for the Use of High-School Principals and Teachers.* Philadelphia, School of Education, University of Pennsylvania, 1926. p. 1.

[8] *Op. cit,* p. 1.

THE NEED FOR A STATE COMMERCIAL TEACHERS' ORGANIZATION

LLOYD L. JONES
Chief, Bureau of Child-Accounting and Statistics, Cleveland

If the commercial teachers of Ohio have the stability, enthusiasm, professional outlook, capacity for growth, the spirit for additional work and the determination to make some personal sacrifice, there is need for a State Commercial Teachers' Organization. If the commercial teachers expect to achieve the recognition they deserve for their subjects as well as for themselves, they must lay a background of facts for their arguments and adjust their work to the best educational practices of today.

In his authoritative book *Commercial Education in Secondary Schools,* Dr. Cloyd Heck Marvin of the University of California, following the figures given by the census and the Bureau of Education, says that about 36 percent of the public high-school pupils are enrolled in one or more commercial classes and about 25 percent are definitely following commercial courses. He also adds that these numbers are growing because 85 percent of all girls and boys who leave our schools from the seventh through the twelve grades enter commercial pursuits.

In addition to this great responsibility placed upon the public schools, is the fact evident in the significant figures of the Federal Bureau of Education which show that the private commercial business schools since 1920 have suffered a reduction of 40 percent in the enrollment of day pupils and 51 percent in night pupils.

Commercial education has often suffered because of the narrow prejudices of both commercial teachers and formal academic educators. It is not surprising that few commercial education people are listed among the speakers on general education programs. But it is surprising to note the relatively small amount of money spent for specific training for and improvement of the teaching of the commercial sciences as well as the limited number of universities and teacher-training institutions offering such courses.

Although more than a million boys and girls in public high schools have some instruction in commercial subjects under eighteen thousand teachers only three states and fewer than twenty cities have directors or supervisors of commercial education. Yet forty states have directors or supervisors of vocational (industrial) arts.

In 1924 the Ohio State Department of Education succeeded in raising the educational standards of commercial teachers, but it fosters a plan of certification after only two years of training in several licensed business colleges.

The Training Received by Commercial Teachers, a state-wide study of the Ohio situation, by J. D. Runkle of Ohio State University, carried a report of 531 teachers distributed in 113 cities and towns in Ohio. He complimented the commercial teachers of Ohio for their professional spirit, for their attendance at meetings, and for their loyalty to their subjects, but showed that they were lacking in practical business experience. He also reported that some teachers were operating two different commercial classes at the same time. Dr. B. R. Buckingham, Bureau of Educational Research, Ohio State University, in *Supply and Demand in Teacher Training*, says Ohio seems to need two hundred commercial teachers each year. Mr. I. R. Garbutt, director of commercial education, Cincinnati, is the only one in Ohio whose primary business is to improve class conditions, help straighten out college credits for commercial teachers, point the way toward better training for them, conduct occupational studies, adjust the commercial curriculum to meet changing business conditions, and keep in touch with drop-outs and graduates of commercial departments.

A few states have separate organizations of commercial teachers, and many have commercial sections of state teachers' associations. Some independent commercial teacher organizations have been absorbed by the state organization.

In order to succeed, there must be some ideals worth achieving and some specific things worth working for. The following objectives are worthy of attention, possible of accomplishment, and are needed. If commercial teachers are to form a successful organization certain objectives should be given attention. A state supervisor and several city supervisors of commercial education should be selected; the standards for the certification of commercial teachers raised; cooperative affiliation procured with organizations of business men in a program to improve commercial courses; and a series of state-wide studies prepared of business practices and requirements in commercial occupations by local subcommittees with the backing and cooperation of various associations of merchants.

COMMERCIAL TEACHER-TRAINING REQUIREMENTS

R. G. Walters
Head, Department of Commerce, Grove City College, Pennsylvania

In making a study of training requirements for the commercial teacher one must necessarily touch on the early history of high-school commercial education. Such a study discloses that the first high-school commercial departments depended almost entirely upon the private business school as a recruiting ground for commercial teachers. Twenty-five years ago not a normal school, college, or university in the United States offered a training course for commercial teachers. Great credit must be given the private business schools for their pioneer work in teacher training, but that was not their function. They were equipped neither in faculty nor in practice-teaching facilities to perform this work.

In granting certificates to commercial teachers the various states could do but one thing—lower the requirements to suit the available commercial teachers. Academic and pedagogic standards for commercial teachers were low. A few states required the passing of an examination, but in many cases the examination was a farce.

Results following these low standards for high-school commercial teachers were natural. Lacking a knowledge of the fundamentals of psychology and pedagogy, teachers used most unscientific methods, which, however well adapted to the business college, were unsuited for the new environment. Because the low requirements for certificates were generally known, commercial teachers failed to secure the respect of their colleagues in other departments. On the other hand, commercial teachers having had little academic training were frequently not in sympathy with academic work, and considerable friction between departments followed.

As time passed, a change occurred in the standards of commercial teachers. Business training received more attention from educational leaders and educational journals emphasized the need for higher professional standards. Several books devoted to the problems of commercial education appeared, and carried the message of higher standards to commercial teachers and to school officials. State departments of public instruction, one by one, raised the requirements for certificates. The greatest factor in professional advancement has been the introduction of commercial teacher-training courses in universities, colleges, and normal schools.

What is the present status of commercial teacher training? During the past winter I made a survey of state supervision of commercial education in the various states of the Union, a questionnaire being sent to every department of public instruction. Information was received from forty-five states, and from the District of Columbia—Illinois, Kentucky, and Nebraska did not reply. The questionnaires showed a number of facts. Thirty-six states had accredited commercial teacher-training institutions.[1] The number of the institutions accredited for the training of commercial teachers were:

	Number of States
Universities	52
Colleges	101
Junior colleges	1
Normal schools and teachers' colleges	55
Private business schools	36

These figures show a surprisingly large number of colleges, universities, and normal schools offering commercial teacher-training courses. On the other hand, it would seem that private business schools are relatively less important than they once were as teacher-training institutions.

The survey showed that a great variety of certificates are now being issued. The sorts of certificates issued and the number of states having each sort are summarized in the following table:

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[1] States which had no accrediting commercial teacher-training institutions were New Mexico, Arkansas, Tennessee, Rhode Island, North Carolina, Washington, Connecticut, Montana, and Mississippi.

Type of Teacher's Certificate	Number of States
Four-year college or normal course[2]	14
Three-year post-high-school work	10
Two-year post-high-school work	24
One-and-a-half-year post-high-school work	1
One-year post-high-school work[3]	3

District of Columbia issues a commercial teacher's certificate upon graduation from a four-year college or normal course.

California and the District of Columbia issue a certificate for three years of training to teach in junior high school.

South Carolina issues a certificate for "less than four years of training," but does not state definitely the time.

Utah issues a certificate "upon evidence of fitness."

Nevada issues a certificate for "adequate training."

Tennessee, Oregon, and Florida issue certificates upon examination.

Mississippi requires that a commercial teacher must hold a regular teacher's license.

Arkansas has no state system of certification for commercial teachers. Licenses are issued by county superintendents.

From these facts, it is evident that the majority of states now require for commercial teachers from two to four years of training beyond high school. This is an advance over the conditions existing twenty-five years ago. It is pleasing to find that the method of granting certificates upon examination is disappearing, for the examinations were very seldom a true indication of the teacher's fitness.

The survey showed that two states require business experience for commercial teachers' certificates. These states are Pennsylvania, which requires six months of experience, and Ohio, which requires eight hours of work a week for a semester. New Hampshire, however, will accredit business experience instead of education for two years of the required preparation in that state. Personally, I feel that the next step in raising the standards for certification of teachers must be in requiring business experience of commercial teachers.

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[2] All these states except Rhode Island, Virginia, California, and the District of Columbia also issue certificates for less than four years of work.

[3] These states are New Mexico, Maine, and Ohio.

One of the interesting facts brought out by the survey was that seventeen states and the District of Columbia no longer certificate teachers to teach the entire range of commercial subjects, but rather they certificate teachers to teach only those special commercial subjects which appear upon the face of the certificate. This indicates a tendency in state departments to recognize a need for specialization among commercial teachers.

What should be the nature of the education of commercial teachers? It must be recognized that the commercial teacher has a definite need for education of three sorts: he must be trained in what he is going to teach; he must be trained in how he is going to teach; and he must have the type of education which will fit him for his civic duties and which will permit him to use his leisure time wisely. The first two are strictly vocational; the third cultural. No plan for training commercial teachers can be considered complete unless it includes all three.

There are certain general commercial subjects with which every commercial teacher should be familiar, regardless of the special subjects he may teach. These general commercial subjects bind together the entire commercial course, and they correlate the work of one commercial teacher with that of another. Business is an exchange of values, and the commercial teacher must look upon business in this broad sense, if he is to correlate his specialty with business education as a whole. As the place-element plays such an important part in business, commercial geography is naturally the first of the general commercial subjects to be included. Economic principles are encountered in the work of the salesman, the bookkeeper, and the stenographer, and for this reason a course in the principles of economics should be included. Every entry made by the bookkeeper, every letter written by the stenographer, and every sale made by a salesman involves commercial law, and hence the need for these subjects. A course in bookkeeping, as well as a course in business organization, will give the commercial teacher a proper perspective of business as a whole and will give him a margin of knowledge beyond his specialty, which will win for him the respect of his students. At times, every commercial teacher must write business letters, even though he does not teach correspondence, and hence his need for a course in the subject. Finally, one would naturally include typewriting, because of the personal value to the teacher.

We are rapidly recognizing the impossibility of having one commercial teacher teach all the commercial subjects. At the present time twenty or more different subjects are being taught in the commercial departments of our high schools. One can readily see the impossibility of anyone teaching all these subjects well—or even a majority of them. The tendency to specialize is growing among academic teachers, but for many years calls will come from small high schools for all-round commercial teachers. As a matter of fact, however, these small high schools do not offer a full range of commercial subjects; instead, their programs are limited to three or four subjects of a clerical nature.

Several years ago I first pointed out in the *Journal of Commercial Education* the fact that the commercial subjects can be classified according to some underlying academic art or science. There are no business subjects which are fundamental in nature. Commercial arithmetic, bookkeeping, and accounting, for example, are branches of mathematics; shorthand, business letter writing, and advertising and salesmanship in part, are branches of English; commercial law, business organization, economics, and history of commerce are social studies; commercial geography, and the psychological phases of advertising and salesmanship are branches of science; and typewriting, penmanship, and office practice are studies in which motor reactions play the most important part. In other words, the commercial subjects are in most cases applied academic subjects.

Once this fact is recognized and the commercial teacher is forced to specialize because of the great growth in the number of commercial subjects, the logic of specializing along similar lines to those followed by academic teachers will be apparent. Thus, the time may come when the all-round commercial teacher will be displaced by the mathematical commercial teacher, teaching bookkeeping and arithmetic; the English commercial teacher, teaching shorthand and business English; the social commercial teacher, teaching commercial law, economics, business organization, and history of commerce; and the manual commercial teacher, teaching typewriting, penmanship, and office practice.

Specialization following the line of vocational relationships, rather than an underlying art or science, is possible. Thus, we may have specialists in the fields of secretarial work, accounting, selling, or the general or social commercial subjects. Regardless of which form specialization takes, the ideal commercial teacher-training course will be so arranged that the prospective teacher can emphasize while in school those subjects he is best fitted to teach.

The commercial teacher must not only know what to teach, he must know how to teach. A word of warning should be given about the danger of over-emphasizing methods in commercial education. It must be remembered that a knowledge of methods can never make up for a lack of knowledge of subject-matter. Granting that the prospective teacher has a thorough knowledge of subject-matter, it is advisable that this should be supplemented by courses in the principles of psychology and education. Psychology is the underlying science of all teaching, and should be included in every commercial teacher-training curriculum, together with a course in the principles of teaching. A course might also be included in educational statistics, for the swing from personal opinion to scientific research as a guide in educational matters makes a knowledge of statistics almost indispensable.

The prospective commercial teacher should have a course in Principles of Commercial Education; a course, which is now offered under a variety of names in many institutions, usually embraces the preparation of a high-school course of study, the selection of textbooks, equipment, the relation of the commercial department to the business community, part-time cooperative work, and similar subjects. Courses in methods of teaching the special commercial subjects which the student is preparing to teach should also be offered. The experiments and investigations of such leaders as Dr. Blackstone, of Iowa University, Professor Yoder, of Whitewater Normal School, Professor Lomax, of New York University, Professor Nichols, of Harvard University, Miss Nies, of the University of Iowa, Miss Anne Brewington, of the University of Chicago, and Dr. Book, of Indiana University, have furnished us with a wealth of materials for courses in methods of teaching commercial subjects.

It must not be forgotten that the commercial teacher is something more than a teacher. He should be trained to earn a living and educated to live a living after it is earned. As a social being he owes certain duties to his nation, his states, and his community. He should understand some of the natural phenomena around him, and he should be taught to use wisely the hours of recreation and leisure he may have, although these are not as extensive as most people believe. All this means that the course must include a certain amount of civic and cultural subjects, especially English, civics, history, and possibly sociology.

Summarized briefly, the ideal course of study will include in the general commercial subjects required of all: commercial geography, economics, commercial law, bookkeeping, business organization, correspondence, and typewriting. The special commercial subjects, which should be elective are: shorthand, additional typewriting, additional bookkeeping and accounting, salesmanship, advertising, and advanced penmanship. Courses in education and psychology, required of all, should include: principles of psychology, principles of education, educational statistics, and principles of commercial education. Methods of teaching the special commercial subjects should constitute elective courses in education. Academic subjects should include courses in English, history, government, sociology, and science—preferably biology.

In considering the teachers already serving it is apparent that many have permanent certificates and will not be affected by changing certification requirements. Nor will they be directly affected by plans for courses of study in commercial teacher-training schools. A few are pioneers in the field, and to them is due the recognition that commercial education has already received. They have borne the brunt of criticism in years past, and much of which is now proposed for young recruits is the result of their experiences. Upon these pioneers depends the further support in the efforts to raise the standards of commercial teachers. Every effort to raise the requirements for certification tends to raise the standards of the profession as a whole and every effort to improve the course of study in the training schools reflects on the credit of those who are now serving.

COUNTY SUPERINTENDENTS

J. W. WHITMER, *County Superintendent of Schools, Toledo,* Presiding

SOME ESSENTIAL QUALIFICATIONS OF A GOOD TEACHER

CLYDE HISSONG
Bowling Green State Normal School

The measure of the degree of expertness in teaching still is, and for a long time will continue to be, largely subjective. Innumerable factors contribute to, or detract from, success in teaching. Probably one of the most important single factors is personality. Taking equal rank on the basis of priority and emphasis in the mind of the investigator, is the factor of management. With a vast number of superintendents, the question of discipline, not management in its larger aspect, is the first and paramount quality for investigation.

Three closely interrelated agencies contribute to expertness in teaching. The first agency is the prospective teacher who must possess the potential possibilities of a good teacher.

The teachers' college and normal schools, as a second agency, must make two major contributions. One of these should be a "forward look," in the field of education as a whole. This attitude should have as its basis, a dynamic and dominating philosophy. It should include a functioning concept concerning the relation of specific objectives and activities to the ultimate end in the educative process. With a dominating and workable concept of education as a life process and a consciousness of the relation of ultimate, major, and minor goals as applied to specific objectives to be attained, the expert teacher must possess this same type of mastery in the field of her major interest. Such a progressive attitude will color teaching and will determine the choice of activities, the selection and use of subject-matter, the methods of procedure, and the points of major emphasis.

The teachers' college also must strive to develop the prospective teacher's insight of the pupil. This does not imply, necessarily, that more emphasis must be placed upon psychology as a subject. It does mean, however, that more attention must be paid to the development of the attitude of mind which will make the teacher a research student and fix the habit of analysis as she deals with individual children and groups of children. The best assurance for a satisfactory teaching technique is a "forward look" and a clear understanding of the pupil. Teaching methods must be evolved from these if teachers are to be developed instead of trained.

The third agency necessary in producing an expert teacher is a good supervisor. Teachers are not hostile to good supervision. They will always welcome a supervisor who can stimulate them to continued growth and enlarged vision. Inner drive, a definite goal, a time limit, and a standard or par score are potent forces in determining maximum achievement. The good supervisor will consider the aid to the teacher in capitalizing these forces one of her challenging tasks.

Expertness in teaching is the cumulative result of three contributing agencies, the teacher, the training institution, and the supervisor in the field. In this connection, then, three of the basic qualities essential to ultimate expertness are, a "forward look," keen insight of the pupil, and good supervision.

THE ATTENDANCE FACTOR IN EXPERTNESS IN TEACHING

J. H. Hixson
County Superintendent, Auglaize County

Ohio schools need a system of child-accounting if good attendance is to be maintained and if the laws of compulsory attendance are to be effectively enforced. Expertness in teaching depends upon good attendance which, in turn, depends upon three factors: the Ohio attendance laws, the appreciation of education value by school patrons, and administration of the law by means of keeping record of every child within the school district. The attendance problem in Ohio exists almost entirely within the last-named factor.

Good attendance does not mean that every child whose name is on the register must be in school. If he is sick or an emergency arises in his home life, it is better that he be at home. Good attendance means his presence at some designated place; bad attendance is his absence from a known place or for an unknown reason. Within the scope of Ohio's compulsory-attendance law it may be possible for all pupils enrolled to be at home, yet the attendance of that room may be good.

Business executives through accountancy have exact data upon their enterprises; the banker, for instance, knows the exact balance of every depositor. In like manner, the attendance department of a school system should have a complete check upon every child every day.

The maps exhibited here are used as the basis of enumeration of school youth in Auglaize County and show the location of all habitable houses in each rural school district or township and the homes of all the children. Through a system of noting all changes of residence regularly the county office has an almost perfect account of all persons of school age.

Interest has been stimulated in good attendance by the wall chart entitled "Let Us Keep Our Record Clean." This chart was devised by the speaker and is used in all the schools of Auglaize County. The chart contains the names of all children enrolled in the school. Attendance data entries are made at the close of each day, showing in color the extent and nature of the absence. By reason of the system adopted a pupil is not encouraged to be in school when his best interests are served by his presence elsewhere. A legal or excused absence is entered as good attendance; an illegal or unexcused absence is entered against the pupil and against the school. The charts are submitted monthly to the county office, and as a result of their use the individual school communities are showing increased interest in the kind of a report sent in.

This system of accounting enlists the home in the control of attendance by requiring written excuses for all absences, and these explanations determine the color of the daily entry upon the wall chart. The excuses are later approved by the county attendance department.

More superintendents of the state should enlist in this field of educational endeavor. Only a fraction of the task of bringing a system of child-accounting toward perfection has been accomplished.

THE ART OF TEACHING A MULTIGRADED SCHOOL

Fannie Dunn
Teachers College, Columbia University

The emphasis of my subject is upon the word *art*, as opposed to science. Science is knowledge, art is skill. Science is a body of abstract principles, art is a body of concrete practices. "Science," in the language of Mills, "takes cognizance of a phenomenon and endeavors to ascertain its law; art proposes to itself an end and looks out for means to effect it." Art also applies means to ends, it employs techniques, and these techniques vary according to conditions, even though the fundamental scientific principles remain unchanged.

The oldest of all educational arts must have been the art of teaching a one-teacher school, for originally all schools were of that type. As communities increased in size, and more children presented themselves to be educated, the end of caring for the enlarged school enrollment brought forth the means of the graded school system. From that time, the art of teaching developed increasingly in terms of the graded school and its conditions.

Meanwhile, teachers in one-teacher schools continued to practice their art. Some of them were skillful practitioners, others were poor and clumsy, but all of them employed techniques suited to the conditions of their work, a heterogeneous group of pupils, often few in number, but ranging in age from five years to eighteen or twenty, and in advancement from the A B C's to algebra.

These schools appropriately came to be termed "ungraded" schools, in contradistinction to the now "graded" schools of the cities. A quarter of a century or more ago, considerable pressure was brought upon the country school teachers to "grade" their schools also, upon the principle that what had proved good for one type of situation would be equally so for another. The principle, of course, was false. The rural schools became "multigraded" instead of "ungraded," and their new constitution, not being an outgrowth of their own conditions and needs, was a hindrance rather than a help to their progress in ways appropriate to them.

If one-teacher schools are to be improved—and those retained must be materially changed in order that the children they serve may have a fair educational opportunity—the art of teaching them must develop from rural conditions and not be transplanted from an entirely different situation. This is quite possible. Techniques may be observed in the present practice of the more skillful rural teachers which may well be exploited and incorporated into a true art of teaching a rural school.

One of the most important of such practices is handling a large heterogeneous group of children as one class. Skillful rural teachers have always done this. I recall Miss Mary ——, whom I supervised seventeen years ago and who had been teaching twenty-five years. Miss Mary's hygiene class included all her pupils from the fourth grade up and was also a reading class. All her pupils could read—that was part of her art of teaching. She had discovered in hygiene a common interest, a basis upon which they could come together, all to get something—some more than others, it is true—and all to give something. Partly reading, partly discussing, under her skillful leadership, her hygiene class was always a period of intense interest.

I remember also Miss Ella —— who taught music. Every pupil in her school participated. They sang by note. The little ones followed the lead of some older girls, who sat nearby. The older ones, by degrees, learned to read the alto, tenor, and bass parts. She never seemed to have any trouble—that was her art. She had learned how to take a heterogeneous group of children and produce a four-part chorus unlike any I have ever heard in other schools which lacked a special instructor in music.

A state supervisor told me of a teacher whom she once saw conducting an arithmetic lesson in denominate numbers with a whole one-teacher school as her class. She had a drawing on the blackboard to help the primary children, but she stood so that this drawing could not be seen by the more advanced pupils. She so conducted the discussion that each child had a share in it; the other pupils answered the more difficult questions; the youngest, those to which the drawing gave a clue; and the intermediate children, the easier questions which required computation rather than mere description of objective facts shown on the blackboard.

Recently I watched a country teacher conduct a geography lesson with all grades participating from the fourth through the eighth. The upper-grade pupils had used advanced geographies in preparation for the class discussion, the others from the lower grades had used the first geography book. Some had read in supplementary geographical readers, others had found pictures in the *National Geographic Magazine,* and others had referred to government bulletins. Sand-table work and the making of booklets had been going on. Every child was participating, even a very dull and backward boy who had been put in the fourth grade solely because of his age and size. As a matter of fact, he was taking a prominent part. "Harold found something for us in the Agricultural Atlas," the teacher would say, calling on her one eighth-grade pupil for his contribution. Or, "Fourth grade, you can tell us about this. You are planning to show it on your sand table."

Each of these teachers was an artist. Each had learned to manipulate the peculiar situation of a one-teacher school, to apply definite techniques suited to conditions, to achieve definite ends in a highly skillful way. Each was master of the art of teaching in a multigraded—or an ungraded school.

An essential element of the art of teaching in such a school consists in the subordination of the so-called "recitation" to the independent study of the pupils. Supervised study, as the term is used in most discussions of the subject, calls for the teacher to be freed, during the pupil's study period, of every responsibility except that of watching him and giving him aid and guidance where she deems it desirable. In the country school, much of the pupil's study must go on at times when the teacher's attention is demanded for class work with another group. Approximately one-third of the school day is about as much time as the teacher of a one-teacher school can devote to any class or group of pupils under her charge. It is impossible for her to supervise their study directly during the remaining third of the time. Yet she must so utilize the class periods, supplementing them with definite, stimulating written assignments on the blackboard or slips of paper, that the pupils employ their study periods with a high degree of efficiency.

This means many types of activities in the so-called "recitation" period, besides recitation. It means, then the work of the unsupervised period is to be a group activity project, getting purpose clearly in mind, setting up plans for work, criticising plans, distributing responsibilities, and reporting progress. When the study is to be one of acquiring skill, through practice, it must be under the teachers' oversight to assure that unsupervised drill later will make perfect because the practice will be of the right type. If pupils are to work with reference materials, class time is demanded for instruction in the use of encyclopedia and dictionary, of indexes, tables of contents, and card catalogues, in outlining and other types of notebook work. As a result of skill in this phase of rural teaching, the pupils are educatively active throughout the day, and important potentialities in self-control and responsibility are realized.

Another factor which is essential to artistry in teaching a one-room school is the ability so to organize the activities of management that they are made definitely educative. The rural school is more like a home situation than any other school. There are children of all ages, but not many of one age. There is—or should be—a schoolground in the care and beautifying of which children may have a definite and helpful share. There are essential housekeeping tasks even if, as in my judgment should always be the case, there is janitorial service for the heavy daily sweeping and weekly scouring essential to keep the schoolhouse as clean as a good home should be. Periodical cleaning days, when the paint is washed, the windows cleaned, and everything put in order; daily tidying after lunch; the preparation and serving of a hot luncheon dish; washing dishes and dishcloths; keeping cupboards, bookcases, and coatrooms in order; arranging flowers; attending to the furnace or stove, and keeping the latter blacked; and regulating temperature, ventilation, and light—all these activities, if skillfully handled involve responsible and capable participation and contribute definitely to wholesome social development of the pupils. Little children need to be helped, protected, and supervised in play outdoors while the teacher is engaged with classes in the schoolroom; the assumption of responsibility by the pupils for routine activities like care of wraps, bell ringing, dismissal, and a modified form of self-government actually aid the teacher and release time which may be employed in further service of the pupils. This participation of the pupils, if distributed wisely so that all may share and none be exploited and if undertaken by the pupils in a spirit of wholehearted social cooperation, affords an extremely valuable means for social-civic education. These activities, directed by the uninspired and uninspiring teacher, the crude artisan rather than the skillful artist, may be but so many more tasks to enforce and of no educative value whatever.

Another important qualification of the rural-school teacher-artist is the ability to see when individual instruction is more serviceable than class work; to organize her school in whole or in part into a heterogeneous group of individuals, each engaged in the work which is of most concern to him at the moment; and to aid by going about in the room, giving a word of advice here, a brief criticism there, sitting down by this child to help him over a difficult place, or calling these two or three to her for assistance on a point which is troubling them.

An industrial-arts period, conducted mainly on an individual basis, will serve as an illustration of this phase of the art of teaching a multigraded school:

> The fifteen children in the B-group (fourth and fifth grades) were doing about as many different things, for this was the period when the teacher was on hand to show them how to do the thing which they later would tackle alone in free periods. First Edna wanted to know how to start crocheting the edge of her handkerchief; then came Alfred saying that the boys needed help with the animals. There were too many boys in too small a space, and a conference then and there settled how many could work comfortably at once, who would come next, and how long each could work. That decided, the teacher demonstrated to the entire group the method of making the stands and wheels and promised to help them paint the finished toys the next week. All but those whose turns came next returned to the room with her and soon were interested in some other Christmas present. The girls were ready for her. They were making stuffed cloth animals; they had their transfer patterns pinned to the cloth, their irons hot, and were waiting for the teacher's approval before going any further. The teacher saw that all was being done properly; she discussed with them what should be done next, and left them to help each other until the end of the period. By this time a small group who had previously made patterns for birch bark gifts had the bark cut and were ready for instruction in the next step. The teacher secured needles and raffia and showed how to buttonhole-stitch the pieces before they could be fastened together. She then worked individually with them until she saw that all understood the process and were working carefully. In their seats other children were working on calendars, blotters, bookbags, or some work which had been started at a previous period.[1]

This same general technique may be applied to arithmetic, English composition, silent reading or any other school subject. The commercial individual instructional materials, now becoming increasingly available, may be utilized in such periods. One child who needs to master addition or multiplication combinations may drill himself by means of a pack of cards; another may be filling in blanks to master some language usage difficult for him; several may be correcting compositions; others using map exercises to master certain location facts; still others engaged in silent reading with self-checking test cards, or outlining a history reference, or anything else. The essential thing is that each child does what he should do at the time and wants the teacher's aid before passing to another level of work. Whether or not all the pupils work simultaneously in one subject is a minor matter.

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[1] Dunn, Fannie W., and Everett, Marcia. *Four Years in a Country School.* New York, Teachers College, Columbia University, 1926, p. 40.

With the four important techniques discussed above, all included in the teacher's abilities—handling a large heterogeneous group as one class, handling a similar group as individuals, making the recitation time an efficient handmaiden to the study periods, and utilizing the educational potentialities of the school régime—the one-teacher school becomes an organic agency of high type for the wholesome development of the child. One writer has said:

> The late Professor Jackman, of Chicago University, believed that a group, heterogeneous so far as the years and attainments of individuals were concerned, could yet be formed into an organic unity which would result in the maximum opportunities for progress of the individuals composing it. From his point of view a system of training based largely on activities, would find in a given group old and young children, some bright and some dull, but each carrying on learning activities in conjunction with others in such a way as to finally attain a maximum result.[2]

If he was right, the one-teacher school more than any other type presents an ideal educational situation. But the art of teaching is essential to utilize the means presented by such a situation to attain the ends desired of education.

I would not have anything I have said be construed as an argument against consolidation or a plea for the retention of one-teacher schools. In many ways consolidation simplifies one educational problem, and probably less of the fine art of teaching is required to achieve desired results in consolidated than in multigraded schools.

As long as we have one-teacher schools, no matter how few their number or how temporary their retention, we should make them as efficient agencies as possible, for the children in them are made or marred forever by them. There is an art of teaching such schools. It can be seen, in some or all of its phases, in many superior rural teachers. It can be analyzed, defined, and described, and it can be taught.

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[2] Dunn, Fannie W. "Made to Measure Organization, not Made over as Second-Hands." *Journal of Rural Education*, 3:358, April, 1924.

In the past we have either foisted upon these schools a different art, suited to a different set of conditions, or we have ignored and neglected them, their teachers, and the millions of American children attending them. We have practically forced failure upon them, merely because the prevailing fashion in educational organization did not fit their measurements. We have developed an inferiority complex in all persons concerned with them. We need to right-about face, to magnify the office of the rural teacher, to find ways and means to increase her prestige and her remuneration, and with her aid to discover and develop the fine art of teaching in multigraded schools. This is an urgent duty of county superintendents, rural-school supervisors, and teacher-training institutions.

EDUCATIONAL AND INTELLIGENCE TESTS

A. R. Mead, *Ohio Wesleyan University,* Presiding

USES AND DANGERS OF MEASUREMENT IN ENGLISH

S. A. Leonard
University of Wisconsin

As Dr. Mead has said, I have been a sort of amphibious person in the education field. My training has been in both English and education, contrary to the advice of both departments. The advice has always been to stick to one thing, but I have not followed it, and so I have been in for a great deal of severe and salutary criticism on both sides. I am interested in objective definite testing from the point of view of English. All my illustrations will be taken from the teaching of English and the testing of English. As you go along, I imagine you can all supply illustrations from your own particular fields.

Of course, it is commonplace to say that the values of objective tests are their definite diagnostic character and their usefulness in teaching. But my friend, Dr. Willing, last year went a long way toward wiping out the notion that we had held of the value of English tests for diagnosis. He showed that there is practically no correlation worth mentioning between any of the objective tests which he used, including a favorite of mine and one of Dr. Pressey's, and the actual performance of pupils in composition. That was very disheartening. But while he was doing that with one hand, with the other hand he and Dr. Whitman were conducting an experiment on the teaching value of these same tests. They found that the improvement in command of English forms by pupils who wrote no composition during the experiment but worked only on practice tests, was almost twice that of pupils who wrote compositions regularly and had them corrected in the usual way. The measurement of improvement was by both tests and count of errors in compositions. I have included Dr. Willing's summary of this supplementary study, which is unpublished, in a review of Dr. Willing's monograph which will appear in the May issue of the *Journal of Educational Method.*

We do not know how diagnostic English tests are. The experiment with grade-school compositions that Dr. Washburn and I carried confirmed Dr. Willing most definitely on practically every point concerning the lack of correlation between these tests and the actual performance of pupils in schools. Dr. and Mrs. Pressey are also checking this, and their preliminary results would seem to show that several possible qualifications of these statements exist. But so far the burden of proof appears to be on those who say that any test will give an accurate picture of what pupils will do in composition. Apparently an accurate diagnosis of these matters of form is to be found only in the compositions themselves.

Nevertheless, no one can give an approved reading test, a test in grammatical form, or a punctuation test such as the Pressey, without having his view of what the pupils should, and can, do in composition considerably changed. He will not get a complete picture, but he will be required to think over and to rejudge what he has thought about composition teaching. The test is a necessary element in any diagnosis. The value of the test, as the Willing and Whitman study indicates, is far more important as a teaching device. And that is one of the particular things that I want to speak about this morning.

However, the dangers of tests must be given attention before we can sensibly consider their possible advantages. These dangers may be conveniently grouped in three divisions: the danger of a mistake in the selection of judges or in the choice of subject-matter for the tests themselves; the danger of absolutism in grading tests and interpreting results; and the danger that they will tend to narrow instruction to matters readily tested by objective means.

I wish to dispose of what my friend, Professor Allan Abbott calls the "ducdame" method of scientific research.

The assumption is that if you ask enough people questions more or less subjective, more or less questions of fact, and tabulate the results, you have a scientific diagnostic picture. The most amazing illustration is given in Dr. Pendleton's thesis, which took two years of inhuman labor in classifying 1,581 objectives in the teaching of English and came to the amusing conclusion that the first and great objective is the ability to spell all the words one uses without looking them up.

We must procure opinions. We have nothing so far upon which to build composition scales except opinions. I think before we can trust composition scales we shall have to examine very elaborately what these opinions are and upon what they rest. I have a discarded tabulation of the scores of one hundred teachers on themes without errors in form, according to the Hillegas formula—that enormous triangular tabulation which has probably given you agony. I threw it aside because I found that, depending upon what theme I started with at any point in the scale, I come out with different samples in my scale for practically every step. Some of the examples which would have been one step above my zero specimen by one route turned out to be two steps above it by another route. I feel that before we can be satisfied with the building of a scale on this "ducdame" principle, we should have much definite discussion and analysis of reasons by the judges.

The only possible way of escaping from the massing of purely subjective judgments in making a composition scale apparently lies in inducing careful examination on the part of judges of specific qualities in composition. For this purpose it seems necessary to narrow the matters comprised in making a scale, and for that reason I have urged the building of scales of composition quality only.[1] If we can get rid of the enormous divergences caused by purely formal differences in composition, concentration on matters of organization, sentence structure, and wording may produce more objective results in scale-making.

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[1] *See* "Building a Scale of Purely Composition Quality," *English Journal,* 14:760-76. December, 1925.

Professor Hatfield, secretary of the National Council of English Teachers and editor of the *English Journal*, has suggested further modifications, particularly in the scales of exposition themes—the preparation of comprehension questions on the samples to be graded which the judges shall answer before grading the specimens. It seems an excellent suggestion, for I have found that a fluent, easy exposition which is inaccurate, misleading, and baffling to anyone who tried to follow its directions, is graded higher by most teachers who attempt to mark it than a perfectly definite but difficult piece of simple explanation which does not have the same smoothness. To build a scale of exposition or explanation on the mere judgments of teachers, even though the judgments do iron out the most flagrant absurdities, would be, I think, quite valueless for the teachers who attempted to use the scale.

We shall always have to proceed, to a certain extent, on the principle of calling persons into a circle when we want to know what conclusions we shall reach. But we shall have to be much more careful in examining who these persons are and not so particular about the precise radius of the circle in which they stand.

Another phase of this first difficulty with objective measurements is that we often do not know upon what they are built. This applies even to the quite objective examination of such matters as capitalization and grammatical correctness. All of the tests of grammatical correctness so far have had to rely for their subject-matter upon more or less unselected sources.

For example, I know scarcely any test of grammatical correctness which does not include some of the popular taboos of English teachers and makers of handbooks who do not know the history of the English language and current information about English usage. The form "have got," which so far as I can find is thoroughly eradicated by our elementary school for classroom use, has always been and is still perfectly correct, cultivated English. So is the form "it is me," which, of course, is anathema to all properly sensitive teachers of English, but which the College Entrance Board has recently accepted, and which in a recent study on usage more than 75 percent of all the judges accepted as perfectly correct English.

Now, that is unfortunate, is it not, because it is not logical? You immediately assume if we must accept "it is me," we must, to be logical, accept "it is him" and "it is us." The point of the whole matter is that there is no logic in this language business at all. Logic has nothing whatever to do with language, much as we might wish it did. All that we can do in investigating matters of usage is to find the facts. And we have been engaged recently on a very elaborate attempt to learn the facts. If you find that "it is me" is accepted, that proves nothing whatever about "it is us." We may guess that if we include that in the next form of the study it will not be accepted or will be accepted by fewer judges. But "it is me" was accepted.

"Who is it for?" seems very terrible until you stop to think that you never say "Whom is it for?" except in moments of tremendous effort. That and "Who did you ask?" are accepted by the majorities of the judges in the study which we have just completed.

This does not mean that the "man who I saw" is correct. Probably it is not. As a matter of fact, it does not occur, because nobody ever says either "the man whom" or "who I saw"; almost invariably "the man I saw," somewhat less frequently "the man that I saw." If anyone has to use either "who" or "whom" here, I think he would use "whom," because it would be on a state occasion with a very formal audience.

Concerning our means of ascertaining these things it is apparent that aside from an actual count of usage, which we have made in part, but which is from various points of view difficult and unsatisfactory, nothing could be done except to pool opinions—in other words, another "ducdame" study. But we took particular pains to find out whose opinion we were including and to separate the various decisions.

First we sent our list of expressions to be judged by twenty-nine internationally known linguists—Dr. Otto Jesperson, of the University of Copenhagen; Dr. C. T. Onions, and Henry Cecil Wyld, of Oxford; Dr. G. P. Krapp, of Columbia; Dr. R. J. Menner, of Yale; Dr. J. S. P. Tatlock, of Harvard; and so on—the foremost students of the English language in its historical and usage aspects. Twenty-six of these men replied, which is, I think, unique in the history of this kind of study, and of their judgments weighted averages were formed. Of the 102 expressions, it was decided to include, as probably acceptable for informal usage, only those which were so received by more than 75 percent of this jury of twenty-six linguists. The expressions ranged all the way from "it behooves them to take action," which is obviously either clerical or otherwise formal, down to "you was." And the judges were asked to put those expressions in four categories numbered from 1 to 4. We used the number 1 for formal, literary English, correct on all occasions of dignity, such as funeral orations and addresses before learned bodies. The number 2 was used for informally correct cultivated English, with no trace of vulgarity—simply good, informal, cultivated English. The word "colloquial" is technically correct, but most people apply it to localisms instead, but many people think it means dialect, and so the word is in dispute; but colloquial is really meant. We had third a category of technical terms, but that was not successful because almost all technical terms were despised and termed "vulgar" by the persons who were not in the particular trade or profession.

And finally, number 4 was used for illiterate or uncultivated speech or writing. Of course, "you was," which was perfectly correct 150 years ago in both speech and writing, was today unanimously rejected by all the juries. It was without exception put in Class 4 as illiterate. And so for "leave me go," "he done it," and the like.

Of more than one hundred expressions, practically all of them taken from handbook or rhetoric lists of what must never, never be used, forty-five were accepted by three-quarters or more of these learned linguists. The accepted list ranges from "It behooves them" and " had rather" to expressions like "I guess I will go to lunch," "my folks sent me a check," "he went right home," and this very interesting one, "Everyone was there, but they all went home early." You know what would happen to the last one if it appeared on a freshman university or high-school theme, but look at it closely and you will see why the linguists accepted it. The youngster is careful to make his verb agree with the singular pronoun, but in the second half of the sentence he changes the *idea* of number. He is not thinking now of each one individually. He is thinking of the whole group, and he has the same right to change there as he has to make a collective noun singular or plural; you would of course expect that. You would find that a much larger proportion objected to "Everybody brought their lunch," because there you keep to a singular idea in "lunch." But in the accepted sentence the change is normal.

Other expressions which are accepted by the specialists are: "What was the reason for Bennett making that disturbance?" My friend Dr. Hubbard, when I asked him whether the possessive is always used before a gerund, said, "Yes; if the possessive is not used, it is not a gerund,"—which of course is logical. In such a sentence as, "Drive slow down that hill," I think more teachers correct "slow" as an adverb than almost any other one perfectly correct form, except possibly "have got."

"We only had one left," "Will you be at the Browns?" and "We will probably come," were all accepted. A very interesting thing occurred there. The British linquists, whom one would expect to reject this more strongly, accepted it more overwhelmingly even than the Americans. A larger majority of the British linguists than of any other jury accepted that expression.

I give this study in so much detail as an illustration of the necessity in all objective tests of examining with great care the subject-matter covered. In the Pressey tests this has been carefully worked out in such matters as punctuation and capitalization on the basis of current usage, but I have spoken in passing of the inhuman difficulties of that sort of work. I made and sent Dr. Pressey a year ago a capitalization test, including "china dishes," "Newfoundland dogs," "dictographs," and various matters of that kind. And Dr.

Pressey replied that it was interesting, but he did not work the test himself. I do not believe it is possible to make more than one or two rules for capitals which will hold water. If you have looked at the leading newspapers recently, I think you have noticed an increasing tendency to capitalize spring and autumn, which all textbooks say should not be capitalized. On the contrary, I saw in one of the Chicago papers yesterday in a syndicated article in which occurred the words Civil War—meaning that of 1860-64, clearly—without a capital.

All that one can say about capitalization is: "Do not capitalize unless you have a particularly valuable or urgent reason for doing so. Always capitalize the names of languages and races"; and then the argument arises as to whether negro should be capitalized.

We could work for years trying to discover standard methods of capitalization and punctuation, and always find a tremendously divided opinion. Dr. Pressey conservatively states only three comma rules. And two of them, current so-called cultivated usage would seem to show, are probably matters of divided usage. I am going to suggest a canvas of punctuation of publishing houses on certain divided matters. For instance, there are three rules for punctuating a series. One is never use a comma after the end of the series; one is always use a comma between all members of the members of the series; and the third is never use a comma before the "and" of the last member of the series. Dr. Fowler discusses that problem very entertainingly in his *Dictionary of Modern English Usage.*[2]

All this is an enormous matter of difficulty, but the tests so far devised still require a great deal of attention; and this includes the tests that I have worked on. They will require a great deal of revision on the basis of what we are discovering of their fundamental units, their subject-matter.

Mr. C. H. Matravers, of Manitowoc, is making a study which I think will be of importance. It is based on conversations by high-school pupils in classes, at parties, on the playgrounds, on the streets, everywhere. From this he has noted the relative frequency per 10,000 words of both the wrong and right form—for instance, both "you were" and "you was," both "we will" and "we shall." Of these figures he proposes to make an index of "social utility," based on the frequency of the need of the form.

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[2] New York, Oxford University Press, 1926. 1064 pp.

You will be interested to know that the form "ain't," or its correct equivalent "is" or "am" or "are not," occurs 35 times in every 10,000 words of conversation. "You was" comes at the top of the list with 2.3 percent occurrence. Forms like "Can or may I " and "Who or whom I saw" are very low in frequency in Mr. Matravers' study, as in the usage study I have reported.

It is evident that we can now revise tests, on the basis of this kind of investigation, to include only forms fairly often needed, and those forms which are flagrant. "You was" and "I ain't got none" or "ain't saw no one" should come first in testing or teaching. Thus we shall probably have some basis for making tests objective on the side of their subject-matter. That is an essential requirement, one for which we have worked hard but have not yet found an altogether successful means of attacking.

The second point I want to raise, perhaps the most dangerous one about any test, is absolutism in grading. It is practically impossible to form a test in which, if you try it over a wide enough area, you will not find enormous holes that you had not suspected. Of course, this is particularly true of the usual comprehension test and of the blank-filling or completion test; but it is true also of the multiple-choice and of every other form which can be devised, because of ambiguity in statements or because of differences in basis of judgment. No test which you have tried in only one or two groups can be considered to have a completed correction sheet. In the Thorndike-McCall reading tests we find question after question which is not provided for in the answer sheet or which does not seem to be fair and consonant in the rights and the wrongs provided among the answers.

The most value for teaching purposes in any test is not in having it collected and corrected and the medians and quartiles distributed, but in having it immediately discussed and corrected in the class. This is the chief teaching value of the test.

For a long time I keenly opposed any use of objective tests in literature. I had that mistaken notion that literature was a sacred province in which tests should not be used. But Professor Abbott first dispelled that by his brilliant experiments in appreciation tests, which, though they are not, of course, of perfect scientific validity, are the most amazingly useful devices for helping the pupils discover what is and is not poetry.

Among the perils of tests, besides their basis on unsure foundations, either in the judges or in the subject-matter, and of their being absolutist and narrow in grading, the third danger is that they will be narrowing in their effects. It is easy to measure mechanical things. And of course the less one knows about the correct mechanics, the easier it is to construct a test. It is much easier to construct a scale or a test of spelling or punctuation, than a test of sentence coherence or organization. It is much easier to construct a test of comprehension in detail than to construct a test of comprehension in larger units. We have made only a few studies in the reading-test field beyond the testing of detail.

The monograph of Judd and Buswell on *Silent Reading*[3] points the way to what we have to do. We must test all kinds of reading which are useful for any person. We have tested a few of them, and we are only beginning.

However, more than comprehension should be tested in literature. We need to test something of appreciation, and something particularly of the pupil's realization of the experience. Was he there? Did he take part? What did the thing mean to him as he read it? What did he see? What did he taste, if anything? And all of those things can be approached by objective tests. Dr. Carpenter, in Ruch's text, has developed some clever measures of this kind. Some good clever experiments of this sort have been developed at Chicago University High School.

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[3] *Silent Reading, a Study of the Various Types.* Chicago, Illinois, University of Chicago, 1922. (Supplementary Educational Monograph, No. 23)

Finding that memory and appreciation do not necessarily correlate, we have ceased to use the memory test with which we began. In the literature test we must make an assessment of what the pupil can get from the printed page of literature. We have for the last two years been devising, testing, and rejecting material of this kind at Wisconsin. We have nothing yet that we like, but we have some beginnings and we are ready now to call for help in trying some of these tests with two ends in view.

No one knows what happens to a pupil when he reads a piece of literature. We can learn a little about his comprehension or his appreciation; we have only a general notion that a few pupils receive a comparatively narrow appreciation of literature from the high-school course and that a great many more get a positive distaste and a boredom. Aside from this general notion, we do not know what the traditional course of *Ivanhoe* and *The Lady of the Lake* and *Macbeth* and *Julius Cæsar* has produced. We need to find out. The only way is to measure the reaction of the pupil himself, and the objective test provides a way of doing that.

A measure of this species has to be tested and retested. A valid way to find out how to score it is in discussion in the classroom. A possible exception is the appreciation and personal-reaction part of the test. I have thought, in giving these tests, of instructing a pupil in the classroom to seal before all the pupils that part of the test, place it in an envelope and address it to the person in charge of the investigation, making certain that it is mailed, so the teacher will not see it. In that way the pupils will answer frankly, and not according to the judgment of the teacher who is responsible for their marks. I like to have the pupils' free remarks on this part of the test to make it fully a test of the validity of the literature for children of that age.

These are ways in which, it seems to me, we can gradually, and painfully move out of the realm of narrow mechanical testing into a type of examination which is objective in reasonable measure. But such a measure is most valuable for its teaching value to the pupils, and, even more, for its information about the course of study. We can agree reasonably well on our objectives, but we will not get very far by this sore of discussion. What we have to know are the actual outcomes in real school situations, and those are best presented in studies like Dr. Hosic's *Empirical Studies in School Reading* [4] and Dr. Irion's *Comprehension Difficulties of Ninth-Grade Students in the Study of Literature.*[5] These are pictures of the actual teaching of the subject, in which is found very little apparent relation between the actual teaching procedure and the desired objectives and the effect of such practice. The only way we can really know is to measure outcomes in the pupils' thought and experience.

Objective tests properly carried out, properly based on knowledge of the subject-matter, and on knowledge of child psychology, guarded from mere subjective opinion at any point, and lifted out of a preoccupation with matters of doubtful facts give promise of achieving the kind of information we need about both outcomes and objectives. In addition to this they are probably the most powerful teaching device ever discovered, provided they are used as a basis for immediate discussion in the classroom as soon as the tests are given, and provided the tests are properly revised after such discussion.

THE ABILITY CONCEPT

S. A. COURTIS

Professor of Education, School of Education, University of Michigan

Public opinion in America differentiates sharply between the practical and the theoretical. It tends to regard the great captains of industry as illustrations of desirable practicability, and college professors as examples of undesirable impracticability. Even within our own profession much the same distinctions are made. A superintendent is proud to be called a "go-getter." He points with pride to his record of achievements as proof that he can "deliver the goods." He tends to be impatient during philosophical discussions of principles which do not "get anywhere." He, too, is likely to regard the college professor as too theoretical and impractical to waste much time upon.

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[4] New York, Teachers College, Columbia University, 1921. (Teachers College, Columbia University, Contributions to Education, No. 114)

[5] New York, Teachers College, Columbia University, 1925. (Teachers College, Columbia University, Contributions to Education, No. 189)

Under the circumstances you can appreciate the trepidation with which a mere college professor comes before you to discuss such a theoretical matter as a concept. From a professor's point of view the real difference between the theoretical and the practical lies only in the time when achievement is attained. The practical is that which results in achievement in the immediate future. The theoretical is that which has for its goal improvement in future achievement. The two types of activity are mutually related, and that mutual relationship is best seen at times like these, when the theorists and the administrators gather to consider their common problems. If I can prove that I intend to discuss matters which bear upon the improvement of your practical procedures, even an hour of discussion of theoretical matters may not be a waste of time.

One function of public-school work is the development of ability, although few practical business men or school agents appreciate the cost of production of ability. Let us consider education as a manufacturing process for a few minutes and determine as nearly as we can the amount of money that has been invested in the production of ability in the children now in the schools of Detroit.

The cost of the raw material upon which the school works is paid by the home. If we accept the figures of the United States Bureau of Labor, the average family has five members and an income of $2,500. When a child is eighteen years old the home has spent $2,400 for food for the child, $1,600 for shelter, $900 for clothing, $300 for fuel, light, and similar necessities, and $300 miscellaneous upkeep, a total of $5,500 per child. These seem to be conservative figures, but if we accept them as the best we have, we can take the average investment by the home in each child each year as $300. This means that when a child is one year old the average home has invested $300 in him, when he is two years old the total amount is $600, and so on. By the time a child enters the kindergarten at the age of five the home has invested $1,500 in him. I wonder how many kindergarteners, as they look over thirty-five youngsters the first day of school, appreciate the fact that the community has entrusted priceless material to their care, material upon which more than $50,000 in cash has already been spent, to say nothing of the pain, weariness, and anguish of mind which these same little tots have also cost their parents.

TABLE I

Manufacturing Costs of Educational Ability

(1)	Home (2)	School (3)	Total Inventory (4)
Intermediate	165,000,000	27,458,800	192,458,800
High	81,066,000	16,417,500	97,483,000
College	9,379,500	2,332,900	11,712,400
Total	$595,695,500	$81,559,000	$677,254,000
School plant			71,104,000
Grand total			$748,358,000

By the time the children enter high school the investment by the home has risen to $4,500 per child, and at graduation from college to $6,200 per child. The dear children are dear in more senses than one.

In school the work of teachers is to modify this raw material and fashion it into abilities of various kinds. This, too, costs money. According to the last report of the superintendent the total per capita costs in the elementary school, kindergarten through grade VI, was $70.63; for the intermediate grades, VII, VIII, and IX, $101.10; for the high-school grades, X, XI, XII, $126.26, and for the college years (Detroit City College), $170.18.

In other words, by the time a child has completed one year in kindergarten the home has invested in him $1,800 and the community $70, a total of $1,870. At the end of the first grade the amount has risen to $2,241, and so on. By the end of the sixth grade the investment is $4,094 per child; by the end of high school, $6,580, and by graduation from college, $8,580. Detroit had 127,308 children in the elementary grades last June, 36,812 in the intermediate grades, 12,780 in high school, and 1,582 in college, a total of 178,482, excluding some 50,000 children in more expensive special schools and colleges. Multiplying the number of children in each grade by the cost per child for that grade and combining the results as shown in Table I, we find that the total cost of the production of ability in the children in school last June was 677,254.

Suppose now by theoretical, impractical research into the elements of ability, it was found possible to improve the effectiveness of teaching even 1 percent, think of the money value of that improvement, not to mention its productive value throughout life. We know that as our schools are conducted at present they are not very efficient, and that the improvements that might be made would produce many, many times 1 percent of gain. From my point of view, therefore, correct thinking about ability is really a most practical subject.

It is unnecessary for me to discuss with such an intelligent group as this the general factors which determine ability. All of you know that ability is always associated with an organism, or mechanism, as I prefer to call it, and that this mechanism at birth is only partially developed. Even at birth, however, children differ in structure and potentialities of development, so that the general quality of inherited nature also becomes a factor determining the character of ability that may be developed. You know also that all growth takes place only as a result of experience. Eating, breathing, sleeping and moving about result in the development of the physical mechanism, and there is apparently a limit to the possibilities of its development. When the organism has reached this limit we say it is nature; and, in general, we mean by maturity the degree of development attained at that time. That is, when nurture acts on nature, development of the mechanism takes place, and in general other things being equal the more mature the mechanism the more able it is. Differences in ability among individuals of the same age group under-going the same experiences are caused by inborn differences in nature.

Whether similar limits of development exist in the field of mental life we do not yet know, but we do know that mental and educational abilities develop with age and that they depend for any group under equal nurture, upon the quality of the inborn nature. Teaching is merely one of the agencies contributing to the development of ability.

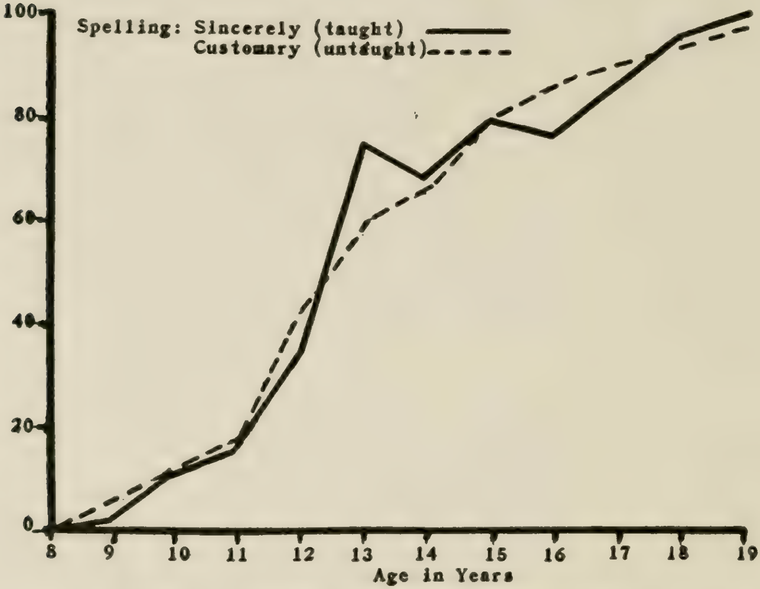

Figure 1.—Factors in simplex growth-nurture.

Ability, thus conceived, is the product of a process of development, and teaching can contribute to this development only by making the conditions of development more favorable. The teaching process is sometimes described as having as its goal the "imparting of knowledge," but it is easy to show that no such thing as the imparting of knowledge is possible. Knowledge is one of the by-products of experience and must be developed, not imparted. As Dewey says knowledge must be actively created; it cannot be passively absorbed. The school can provide and direct experiences which result in the development of ability, but it cannot transfer or create ability. Moreover, the experiences provided by the school must be of the right kind, and the conditions must conform to the laws of growth or the school's efforts are futile.

We may make these ideas clear if we use a specific illustration. The word "sincerely" occurs in the Detroit Course of Study and is taught in Grade VII where the children are thirteen years old. The word "customary" does not occur in the Course of Study and is not taught except by chance here and there. These two words have been chosen because ability to spell each of them develops at approximately the same rate as is shown by the lines drawn in Figure 1.

Among eight-year-olds, less than 1 percent of the children can spell either word, at the age of nine years approximately 5 percent of the children can spell the words, at ten years the percentage has risen to approximately 10 percent, and so on. At thirteen years, when the word is taught, the percent for "sincerely" jumps to 75. Comparison of this 75 percent with the 60 percent for "customary," indicates that the effect of teaching was to increase the amount of development by about 15 percent. Note, however, the rapid decay of this ability in later years. Many recent studies, such as those of Gates and Reeder, indicate similar decay of ability, when abilities are developed in excess of need. The important idea to be emphasized at present is that ability results from development and teaching is merely one way of furthering development.

Perhaps the best way to emphasize this point is to state that study of the growth curves for many different types of abilities shows that they are all of the general form of the curve for the word "customary" and may all be resumed by the formula

$$y = n^{r^{t}}$$

in which

n=nature element,
r=rate of development, and
t=time.

For instance, if

$n = 1 \times 10^{-40}$
$r = .2$
$t = 1, 2, 3, 4, 5, 6,$ and 7 one after the other, and
$y =$ percentage of children passing a given Binet test

then a curve showing the simplex growth similar to that in Figure 2 may be plotted.

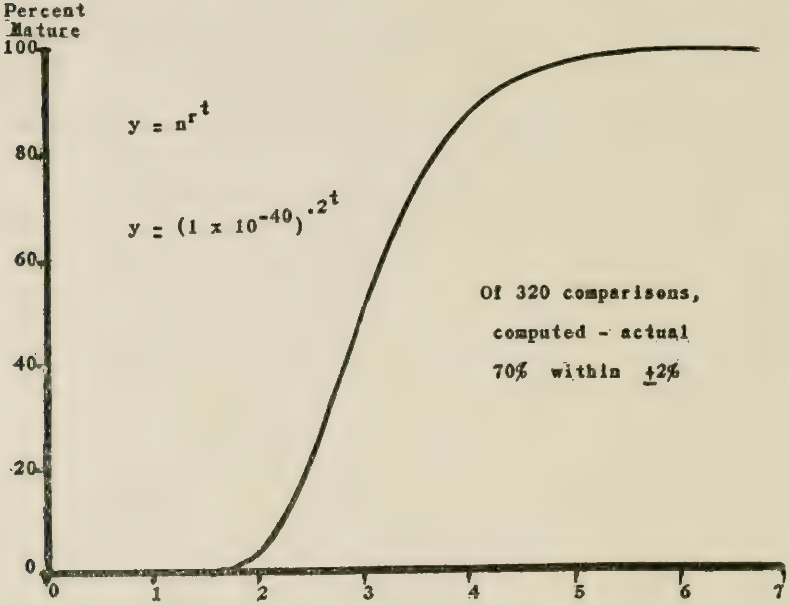

Figure 2.—The simplex growth curve.

Of 320 comparisons of computed and observed values for all sorts of development, physical, mental, educational, sociological, 70 percent of the computed values fell within ±2 percent of the observed values. No single growth curve has been found where the development is that resulting from constant nurture operating on constant nature, which does not conform to this type. The law above, therefore, may be called the law of biologic growth. The development of ability by teaching is only a specific case under the general law; for, in general, ability is something which grows or develops.

School teachers are more interested in the manifestation of specific abilities by particular children than in general laws of growth. Let us, therefore, turn to the measurement of ability and to the interpretation of the results of tests. Perhaps the first phenomenon to be considered is the variation in score from test to test.

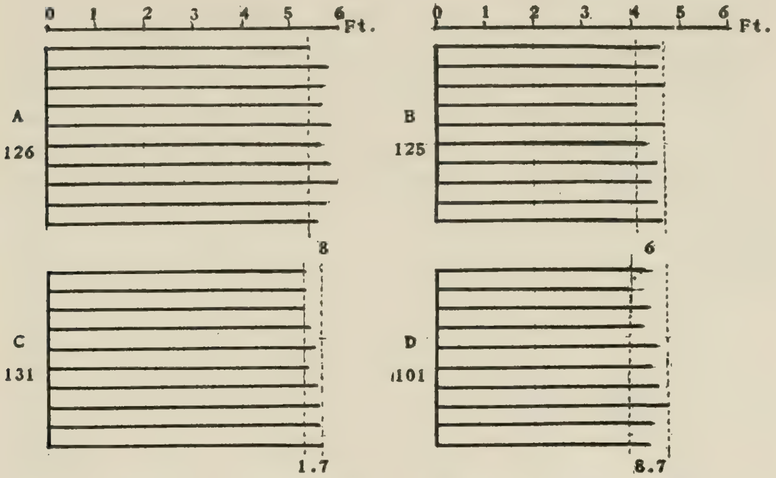

Figure 3.—Broad jump—variation in performance.

As a concrete illustration let us consider the ability of girls of nineteen and a half years of age and 65 inches tall to jump (broad jump) which is summarized in Figure 3.

Each girl jumps ten times in succession. Girl A whose average jump was 5.8 inches varied from 5 feet 4 inches to 6 feet 0 inches, a range of variation of 8 inches; Girl B varied but 6 inches, while Girl C varied 1.7 inches, and Girl D 8.7 inches. Immediately a problem arises; shall we call the ability of each girl her average jump, her maximum jump, or her least jump; or shall we say that the ability of the girl varies from moment to moment so that she has as many abilities as there are trials?

There are, of course, no clear answers to these questions, and each person for practical affairs chooses the procedure he likes best. In athletics we judge of ability by the record or maximum jump, and this is the method adopted by all primitive thinkers.

Human nature seems instinctively to value the novel, the unusual, out of all proportion to its real worth. For practical affairs it is really safest to base prediction on average performance. For our purposes, however, it is the variation itself that is important. How is it to be accounted for? What light does it throw on the nature of ability?

We can readily see that such variation is merely an indication that jumping is a complex performance. Each jump involves the cooperation and synchronized action of many muscles and organs. A slight variation in breathing, or in the swing of the arms, or in any one of a dozen particulars will effect the distance jumped. A record is made only when perfection of control is achieved. Quite clearly, a performance has at least two aspects; one, a magnitude aspect, and the other, a control aspect.

Girls A and B, for instance, are of practically the same age, height, and weight, yet one jumps on the average almost a foot farther than the other. In terms of development, one has achieved a greater magnitude of development, not in height, nor in weight, but in some factor, perhaps strength of muscle. If both girls have had equal training, then the difference is inborn; but, if one has had more experiences which develop jumping muscles than the other, the difference must then be ascribed to training.

On the other hand, Girls B and D differ 24 pounds in weight but jump on the average an equal distance. It requires more strength to jump 125 pounds a certain distance than to jump 101 pounds the same distance. Therefore, just as A's jumping ability is more developed than B's, so B's must be judged to be more developed than D's. Between A and B, it is the greater distance which indicates the superiority, but between B and D, it is the greater weight. Therefore, if we really wish to determine the relative ability of the three girls in jumping, defining jumping ability in terms of strength of jumping muscles, we ought not to base decision on the actual distances jumped, but upon the distances they would jump if all the conditions, except strength, were equal. For instance, if D weighed 125 pounds and retained her present strength she would probably jump only three and one-half feet. In terms of actual performance A has the greatest ability, and B and D are equal; but in terms of ability under standard conditions A has greater ability to jump than B, and B has greater ability than D.

A second factor is control. A, B, and D all show about the same degree of control in that their variations in the series of jumps are approximately equal. Undoubtedly if D weighed 125 pounds her variation would be reduced slightly and this would increase the resemblance. C how, ever, is a more reliable jumper. Her variation is approximately one-fourth that of the others. She weighs slightly more than A, jumps the same average distance and shows less variation in her performance. Undoubtedly, if she weighed but 125 pounds and had as much freedom of control as A her average jump would be greater than A's. C, therefore, is probably the most able jumper of the group.

Someone will ask why we call her the most able jumper if she actually does not jump the farthest in a contest. The answer is that performance is one thing, ability as here defined is another, and that the most able individual ought to be the most able performer, and if the cause of C's lack of freedom is removable by training C can be made the best performer also. The figures show merely that C has some peculiar factor operating. Good teaching will locate that factor and give the experiences necessary to develop proper control over it. It may be a physical factor, such as stiff knee joints, it may be a mental factor, as lack of effort in releasing energy, or it may be a lack of knowledge of the best technique for jumping.

In any case, it should be clear that actual performance in jumping is a complex resultant of many factors, like weight, fear, or self-consciousness, which have really no inevitable connection with the ability to jump. If we wish to define ability as performance, it is easy to determine who has won in a particular contest; but it is not easy to determine who might be trained to win. For in teaching it is much more important to know the factors operating, the stage of development achieved in each factor, and the possibilities of further development.

TABLE II

INDIVIDUAL VARIATION IN TWO SUCCESSIVE TRIALS OF A DIVISION TEST

	FIRST TRIAL		SECOND TRIAL		DIFFERENCES	
	Examples Tried	Examples Right	Examples Tried	Examples Right	Tried	Right
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	8	6	6	5	—2	—1
2	8	7	9	9	+1	+2
3	9	8	9	9	0	+1
4	9	8	10	10	+1	+2
5	9	8	13	13	+4	+5
6	10	9	12	12	+2	+3
7	10	10	14	14	+4	+4
8	12	11	12	12	0	+1
9	13	10	10	7	—3	—3
10	13	13	13	12	0	—1
11	13	13	13	12	0	—1
12	13	13	13	13	0	0
13	13	13	15	14	+2	+1
14	15	15	14	12	—1	—3
15	15	15	15	12	0	—3
16	15	15	14	14	—1	—1
17	15	15	16	16	+1	+1
18	16	16	19	19	+3	+3
19	16	16	16	16	0	0
20	16	16	15	15	—1	—1
21	17	17	23	21	+6	+4
22	18	17	16	16	—2	—1
23	18	18	19	18	+1	0
24	18	18	14	14	—4	—4
25	19	19	17	17	—2	—2
26	20	20	18	18	—2	—2
27	20	20	19	19	—1	—1
28	24	24	24	24	0	0
29	24	24	24	24	0	0

The situation is precisely similar in the case of the educational tests. For instance, 29 girls each nineteen years old were given in succession two trials of a long division test. The scores of the various individuals showing marked differences in variation are listed in Table II. The range in magnitude is from 8 to 24 examples and in control from a change of +6 examples to a change of —4 examples (see Columns 6 and 7). Performance does not represent ability here. It is easy to think of performance as a complex resultant of which real ability to divide is but one of the factors determining score.

Since variations in score occur naturally, let us pursue the ability concept further by deliberately varying conditions, much as we might test out an automobile by trying it on a level road to find its maximum speed, testing it on a hill to determine its climbing powers, or driving through city traffic to observe its performance when running slowly. No one thinks of an automobile as varying in ability in these situations. If the engine is rated at 65 brake horsepower we know the engine will not vary in the power delivered, but we expect variation in the way the power makes itself evident in the various situations. Therefore, let us take a single mature individual, consider that his ability remains constant and see what happens to the expression of that ability when we change the conditions under which it is expressed.

The subject used in this experiment was a mature individual who had been writing for twenty-five years. It was not likely that his ability would be changed by a short series of tests. (1) When asked to write "Mary had a little lamb" over and over again as well as possible, paying no attention to rate, he wrote 51 letters per minute and quality 75 Ayres. (2) When asked to prepare a sample of his best writing he wrote at the rate of 63 letters per minute and quality 70. (3) He was given a standard paragraph to copy as well as possible, disregarding rate, and his rate was 72 and his quality. (4) He was asked to copy the paragraph rapidly and well, and his rate and quality were 84 and 65, respectively. (5) When asked to write "Mary had a little lamb" rapidly and well, his score was 96 for rate and 65 for quality. (6) When he was asked to copy Lincoln's Gettysburg address rapidly and well, he wrote at the rate of 92 and a quality of 55. (7) When he copied a standard paragraph as fast as possible, disregarding quality, his rate rose to 143 and the quality fell to 20. (8) When he was asked to copy the standard paragraph while standing, holding the paper in his hand, and writing without other support, his rate was 83 and quality 45. All of these tests were given within an hour. (9) Eighteen months later he was again asked to copy the standard paragraph rapidly and well, and this time his scores were rate 90 and quality 65.

The significance of this variation is best seen in Figure 4[1] in which the standard rate and quality scores judged by the Ayres test are shown for comparison. It is apparent that ability may express itself very different under different conditions, or to put the same truth in a different form, *different rate and quality scores may indicate exactly the same ability.*

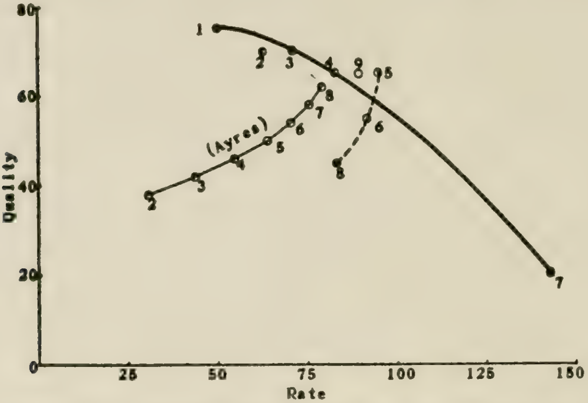

Figure 4.—Handwriting scores of one individual tested under varying conditions.

Evidently in handwriting also performance and ability are different quantities. Performance is described by rate and quality scores, but neither of these describe ability any more than either length or width describe the area of a rug, or than either the number of bills, or the size of each bill, alone tells the amount of a man's wealth. Rate and quality are aspects of ability just as length and width are aspects of area. If we wish to compare the areas of two rugs, we may not compare the lengths or the widths. We must express both rugs in units of area before the comparison is valid.

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[1] Thanks are due to the Public School Publishing Company for the privilege of using Figures 4, 5, and 9.

Such considerations suggest that it ought to be possible to do something to rate and quality scores to change them into ability scores. The study of the curves of many individuals tested under varying conditions brought to light some in which all the scores fell in a straight line. Moreover, many of these lines have a 45-degree slant so that the sums of the rate and the quality scores are constant. Thus, in Figure 5 the individual who in a rapid-writing test scores rate 127 and quality 10, and in a careful-writing test scores rate 77, and quality 60, has an ability score of 137 from both tests.

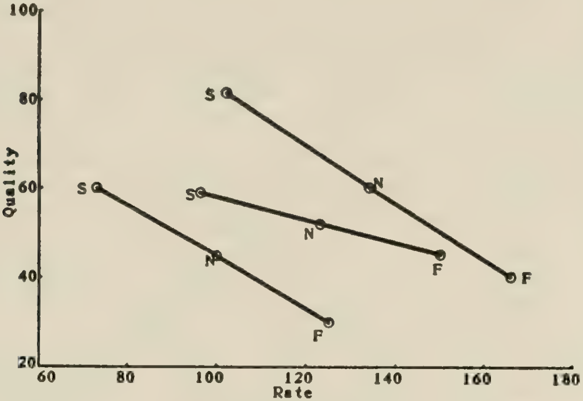

Figure 5.—Straight line adjustment curves in handwriting.

If the sums of the rate and accuracy scores from one individual were constant, the problem of measuring ability would be easy. However, the sum of most scores obtained in a series of tests is far from constant. For instance, for the nine tests given the individual described above, the sums are 126, 128, 133, 140, 147, 149, 151, 155, 166. Evidently the situation is so complex that mere addition of rate and quality scores does not yield a measure of ability.

A little consideration will suggest that the attitude and desire of the individual also affect performance. For one trial the individual may be interested enough to put forth his maximum effort; before the end of the eight repetitions, the individual may be bored and refuse to write a letter. Thus performance, whatever the ability, may be between zero and the maximum of which the individual is capable according to the incentive the individual has to exert himself.

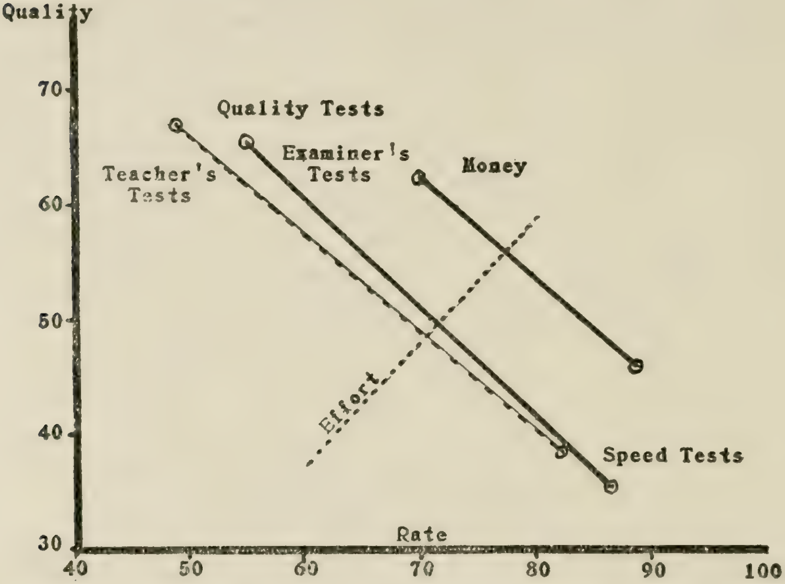

Figure 6.—Displacement of a group adjustment line by effort. Sixth-grade group. Handwriting—Money incentive.

To test this hypothesis, the teacher of a certain sixth grade gave the pupils a speed test and a quality test in writing. The average scores of the class were, speed test, rate 82.2, quality 38.7, ability 120.9; quality test, rate 49.0, quality 67.2, ability 116.2. That is, these scores lay almost exactly on a 45-degree line, shown in Figure 6, which indicated that change in score did not mean change in ability but an adjustment of performance to fit the testing conditions.

Next an examiner, strange to the children, also gave speed and quality tests. This time the scores were for the fast test, rate 86.4, quality 35.2, ability 121.6; and for the slow test, rate 55.0, quality 65.6, ability 120.6. These scores lay even more perfectly upon a 45-degree line and this line agreed well with the range of variation procured by the teacher.

The examiner now poured out a bag of dimes into a bowl in the sight of the children and promised a dime to every child who would beat his own record when the tests were repeated. There was no child who did not earn at least one dime. The class averages for the speed test were 89.7, quality 46.00, ability 135.7; and for the quality test were rate 70.2, quality 62.7, ability 132.9. These scores again fall approximately on a 45-degree line, but the ability score is 9 percent greater than before. The money as an incentive operated to increase the performance. Ability, therefore, as measured by the sum of rate and quality is a function of motive.[2] The changes produced by changes in effort are seen to be at right angles to the adjusted changes. Unfortunately, at present we have no objective means of measuring objectively the amount of effort exerted.

In a recent experiment I gave four composition tests to a class of college students. In the first, they were asked to reproduce a story read to them; in the second, they were asked to write an original story; in the third, to write as well as they could paying no attention to speed; while in the fourth, they were asked to write as rapidly as possible, paying no attention to quality. All four sets of compositions were scored carefully for rate of composition in words per minute and in quality by the Trabue scale. The scores showed the usual variations due to changes in adjustment and effort.

Some time later it occurred to me to compare the changes in composition scores with the changes in handwriting scores, so I had the composition scores carefully scored for rate and quality of handwriting by judges who did not know the object of the experiment. The results shown in Figure 7, prove that sometimes both sets of scores change simultaneously in the same manner and sometimes they change independently.

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[2] Abridged from Courtis, S. A., *Why Children Succeed.* Detroit, Michigan, 1807 East Grand Boulevard, 1925. pp. 124-32.

For instance, individual A has almost the same pattern of changes in both composition and handwriting. The reproduction test did not appeal to him and his ability scores for this test are much below those for the other tests. In the other three tests, he put forth practically the same amount of effort so that the changes in both handwriting and composition are mere adjustment changes.

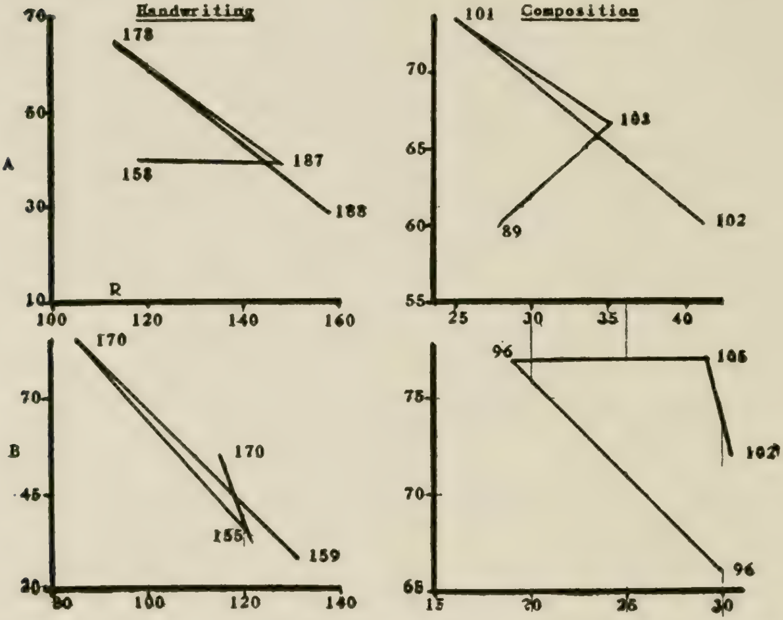

Figure 7.—Comparison of simultaneous changes in ability. Sequence of tests—reproduction, standard, quality, speed.

Individual B, however, on the reproduction test put forth almost his best efforts, but much more effort in composition than in handwriting. In composition the original story called out even greater effort, but at the expense of effort in handwriting. In both tests, however, the adjustment lines are nearly 45-degree lines.

If we attempt to compare A and B in ability, what scores shall we use? Note that each made one ability score of 102 in composition, but under standard conditions their abilities are much more nearly as 96 to 102 than 105 to 89, the scores on the reproduction tests. Similarly, in handwriting both individuals made scores of 158-159, but their abilities are probably much more nearly as 165 to 183, than as 170 to 158, their scores on the reproduction tests. A single test does not furnish sufficient information upon which to base reliable judgments of individuals. Many studies have been made which prove that performance may be varied at will. We need, therefore, a concept of ability which is independent of performance.

Let us revert once more to the automobile for an analogy. On the steering wheel of many automobiles two important controls are manipulated by the driver. One advances or retards the spark, the other increases or diminishes the supply of gasoline. The performance of the engine is determined in part by the way these controls are set. The engine may be made to run with little power, or with great power, by manipulating these controls. In the gear shift is another type of control. Even though the sparks and gasoline are kept in one position, by means of the gear shift, the wheels may be made to run slowly and with great power, or rapidly with little power. Yet under all these conditions, yes, even when the engine is not running at all, we think of it and describe it as a sixty-five horsepower engine.

I suggest, therefore, that the facts already presented make it possible to think of ability and performance in similar fashion. In handwriting, for instance, we may think of the natural growth process as developing the writing machinery, while teaching brings out the adjustment necessary to make the mechanism write. Ability is thus a mechanism like an engine. Like an engine, also, its ability can be defined as the performance of the mechanism under standard conditions. That is, ability is measured by the performance of the mechanism when the controls and gears are set according to a standard pattern, and the mechanism is properly energized. The product of training is essentially an objective mechanism, and teaching is bringing about certain adjustments in the mechanism.

This concept of ability as a mechanism emphasizes the fact that performance is always the resultant of the joint action of at least four types of mechanism, and that performance should never be used as a measure of ability until all the mechanisms are operating under standard conditions. For instance, when a child is taught handwriting and then takes a handwriting test, the major mechanism functioning is, of course, the specific handwriting mechanism. The exact nature of this mechanism we do not know, but in its essential nature it undoubtedly consists of a fairly permanent and stable pattern or organization of neurone connections. This writing mechanism derives its energy from another mechanism to which we give various names, emotion, drive, desire, interest, or purpose. The stimulus that arouses interest and leads to the writing activity is always related to values, not to handwriting. The handwriting is used simply as a means of achieving a desired goal, much the way we use an automobile to drive to a golf club. If desire is strong, much energy will flow through the writing mechanism, and performance will reach a high level. If desire is weak, little energy will be available and performance will be on a low level. Whatever the energy supply it will be delivered from the specific handwriting mechanism to the motor mechanism through something corresponding in function to gears. That is, the individual may expend a given amount of energy in rapid writing, in which case the writing will be of poor quality, or he may choose to write well, in which case the writing will be at a slower rate. Both the adjustment mechanism and the energizing mechanism are set by still another mechanism which, for want of a better name, I shall call the control mechanism. The control, energizing, and adjustment mechanisms may be, and are, used whenever the individual reads, swims, does the broad jump, or carries on any activity, as well as when he writes, but the writing mechanism is brought into play only when the individual writes. In teaching handwriting, sometimes our problems have to do with development of the control mechanism, sometimes with the energizing mechanism, sometimes with the adjustment mechanism, but these are general problems and only indirectly influence handwriting. When our teaching directly influences the specific handwriting mechanism, then and then only ought we say we are developing ability in handwriting. Note that from this point of view, the contribution which instruction in handwriting may make to the development of the more general mechanisms may exceed in value that of the development of the specific ability, handwriting.

Plenty of experimental results are available to prove that precisely similar conditions prevail in all testing. Children vary in effort and in adjustment in arithmetic tests, in typewriting tests, in reading tests, in intelligence tests, and in all other tests without exception. It is sometimes claimed that power tests, or performance scales, eliminate such variation, but this claim is easily proved false. Such tests and the method of scoring adopted conceal the variation; they do not eliminate it. Any interpretation placed on test scores which ignores the factors discussed above is almost certain to be wrong, particularly when the scores are scores of individuals.

This is probably the place to comment on some common errors about speed and accuracy made by men who should know better. For instance, Superintendent McAndrew has entertained himself and others by proclaiming up and down the country that the New York Survey in 1912 reported that his school had the highest rate and lowest accuracy, which he proceeds to interpret to mean that his school excelled all others in getting examples wrong. Thorndike, too, on occasion, justifies his own neglect of the speed-accuracy situation by stressing the fact that the rate at which an individual gets examples wrong has no social value. Your own Buckingham has been indiscreet enough to publish similar confusing statements.

The truth in all these characterizations of the speed-accuracy situation is, of course, the social value of accuracy. When an individual is assigned a life task, the only performance which counts is the correct solution. We need to teach children how to set their control mechanisms so that their ability mechanisms will operate at a speed just a little less than that at which they can achieve with 100 percent accuracy. That is why in all my practice tests the standard is set at 100 percent accuracy. I recognize fully and completely the need for perfection in achievement and believe as strongly as anyone in the social value of accuracy.

When it comes to measurement, however, the situation changes. The fact is that approximately 90 percent of the average individuals do not achieve 100 percent accuracy in their work, and the question at once arises, what does it tell about the ability of an individual when he tries 24 addition examples in a certain test and gets only 12 right. Calling his ability 12 does not solve the problem as far as social value is concerned, for the part of arithmetical work which is right when only 50 percent accuracy is achieved is worthless for practical purposes. My point is that if I am the individual who tries 24 examples and has 12 right, further testing proves such a score means that I can do 17 examples and have 17 right if I choose. Moreover, it means that I am more able in addition than someone who tries 14 examples and has 14 examples right. In measurement it is not the social value of accuracy which should be considered but the meaning of the scores obtained.

In the broad jump, we understand that a variation from a jump of 5 feet 6 inches to 4 feet 8 inches, has an explanation in terms of the defective functioning of the mechanisms involved. In handwriting, also, if a score changes from 40 letters per minute at quality 60 to 60 letters per minute at quality 40, we are not greatly confused by the change. In arithmetic or reading or similar tests, where performance is measured by the all-or-none method, for an individual to try 24 exercises and have only 12 right, immediately brings to mind the social value of accuracy to confuse the issue. A score of 24-12 in such cases, however, merely indicates that the mechanism is functioning at such a rate, it cannot function precisely. An error of a single combination in addition, or of a single letter in spelling, causes the whole exercise to be wrong, and the frequency with which such errors occur is a valuable measure of the way the mechanism is functioning, Thorndike to the contrary, notwithstanding. It seems to me that only a biased or an uninformed mind would be willing to dismiss the rate-accuracy situation with facetious remarks about "rate of getting examples wrong." Fortunately in such matters one does not have to depend upon the statements of authority. Each one of you may give tests under varying conditions, and determine for yourself the truth or falsity of the idea that the same ability may express itself in a variety of scores as conditions change. Fortunately also effort is being measured objectively these days, and the part it plays in performance is being precisely determined.[3]

The significance of this truth, that ability is never indicated by performance except by chance lies in the fact that estimates of ability can be made reliable only from tests given under uniform conditions. In meteorology, the weather man does not compare the readings of the barometers at Denver and New York at their face values. He knows that Denver is at a higher altitude than New York, so before making comparisons he corrects both observations, as may be necessary, to "standard conditions." So in education we must correct our observations to standard conditions and make scores comparable before we can expect to draw reliable conclusions from comparisons.

For instance, if we give twenty tests in handwriting to one individual, we secure scores which vary widely. In Figure 8 *dime* means the scores made for a money incentive. *Appeal* is the response made to a teacher's special plea for effort. The dotted oval indicates the field of variation for this individual. Let us agree to measure ability by the scores which represent the center of the field of variation, and for each child let us compare his scores on a single test with the scores for the midpoint of his field of variation.

If we compare individuals A and B on the basis of a single test in Figure 9, they appear to differ 10 points in rate and 30 points in quality. B would ordinarily be considered the more able. If we use midpoint as a basis, not only is the difference between the two greatly lessened, but their relative abilities are reversed, A being truly the more able. The explanation is that in the single test A chose to write as fast as he could, while B wrote as well as he could, and this difference in the way they responded to the test conditions renders their scores incomparable. When we explore their entire field of variation and locate the center of the field, our comparison of center scores is based on comparable data. In similar fashion, C and D represent two individuals who were judged on one test to be just alike but really differed widely in ability, while E and F appear to differ widely but were really of the same ability. The practical conclusion from such results, it seems to me, is that before we judge the relative abilities of individuals we must test them under a variety of conditions and base comparisons only on scores which represent the comparable types of response.

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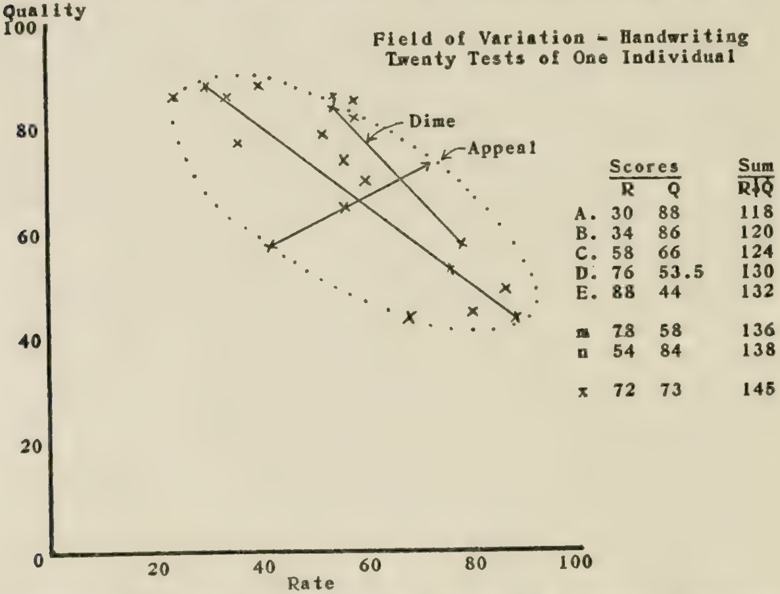
[3] *See* Davis, Emily C. "Tests Show Effect of Noise on Nerves," *Science News Letter*, 9:321, April 9, 1927.



	Scores		Sum
	R	Q	R+Q
A.	30	88	118
B.	34	86	120
C.	58	66	124
D.	76	53.5	130
E.	88	44	132
m	78	58	136
n	54	84	138
x	72	73	145

Figure 8.—Variation in performance caused by changes in factions affecting functions of ability.

Finally, I wish to call your attention to a more obscure factor which I believe affects greatly the results of teaching. It is directly related to, indeed grows out of this rate—accuracy problems.

For instance, the Detroit Department of Research has recently completed a survey of handwriting in the Detroit schools.

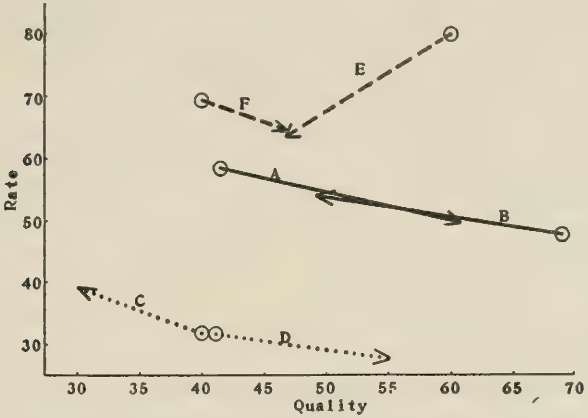


Figure 9.—Effect of correction to standard conditions.

Rate and quality were found to increase steadily through the eight grades, but while rate continued to increase through high-school years, quality fell off slightly. Among the students in Teachers College, however, rate dropped and quality rose. These results shown by the dotted lines in Figure 10 will be readily understood by those who have followed the discussion already given. Under training, both rate and quality increased. When training stopped at the end of the elementary school, rate increased because the high-school students continued to mature physically. Because of this greater energy, and the lack of specific emphasis on quality, the response of high-school students to the test conditions tended to emphasize speed more and more. The students in Teachers College, however, were instructed in the social value of quality. They understood that a teacher's writing on the blackboard must be of good quality. Consequently, the adjustment of their mechanisms was shifted from speed to quality. If the development of ability in terms of ability scores is studied, the development of ability, shown in Figure 10 by the heavy line is seen to be fairly uniform throughout the system.

The true picture of the actual situation is best obtained from a three-dimensional graph.

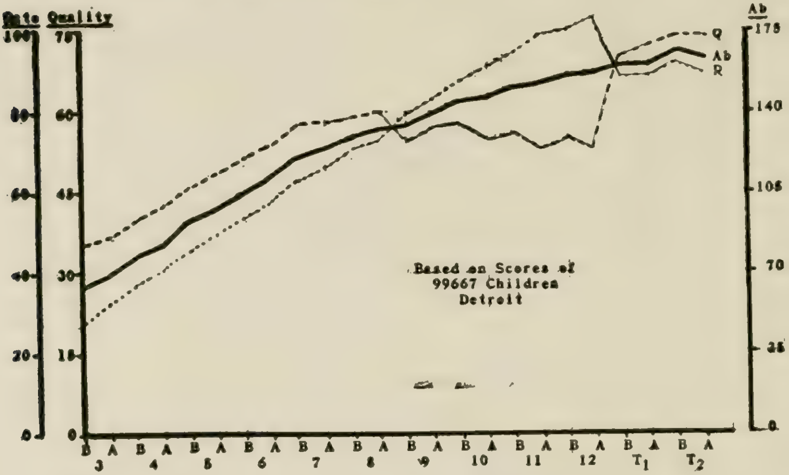


Figure 10.—Development of ability in handwriting—rate, quality, ability.

In Figure 11 the three axes are Grades II to VIII, rate and quality. If we consider only the dotted line in the plane whose axes are grade and rate, we have the conventional graph of rate scores. The dotted line in the plane whose axes are grade and quality is the conventional graph of quality scores. The true graph of ability scores, however, is the solid line in space, of which the other two graphs are mere shadows or projections.

This position of ability in space becomes a new factor which must be considered. For instance, a teacher gave her class a normal test, a speed test, and a quality test in handwriting in October to map out their fields of variation. In January, she repeated the tests.

When these results are shown in three dimensions of Figure 12, it is easy to see that individual A is developing along one pathway, and individual B, along quite another. Each benefited by his experiences during the semester but each in his own way, and neither has achieved the scores set as standard for the grade. It is quite possible that each individual should have his own standard. It is certainly true that the two individuals will need different treatment to bring them to standard development. It is probable that the nature of this treatment will be determined by that factor which determines the pattern of development followed by each individual.

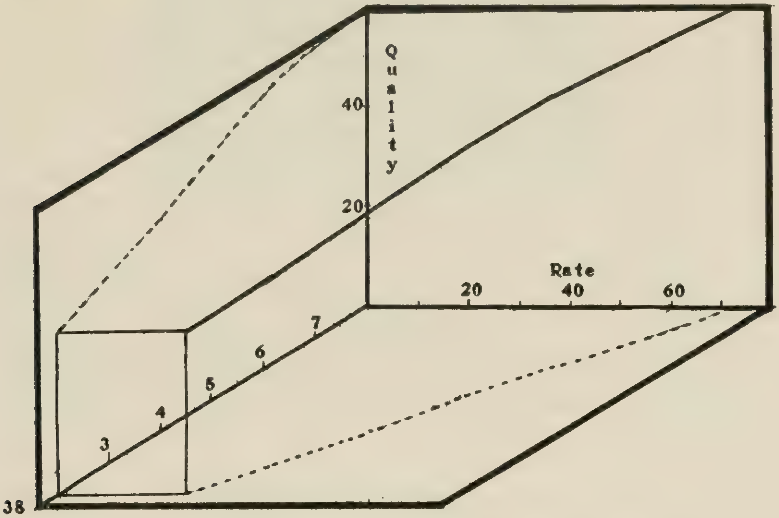


Figure 11.—Development of ability in handwriting—Grades II to VIII.

The nature of this new factor is unknown at present, but it is comparable to "build" in the physical organism shown in Figure 13. We are not so foolish as to require that the individual who inherits a tall-thin build or a short-stocky build must grow into average proportions. It is probable, —yet, almost certain—that there are differences in individuals mentally which determine in similar fashion their patterns of mental development. If so, teachers need to discover these factors and to construct individual courses of study suitable for each pattern. This is a problem which is likely to tax the powers of practical school administrators for some time to come. If these facts are true, improvement in efficiency can be obtained in no other way.

By way of summary, let me suggest that a study of the variation in score of individuals under changes in testing conditions proves that scores do not measure ability but performance; that performance is always a resultant from the joint action of at least four types of factors—three of which are general in character, a motor mechanism, and energy mechanism, and a control mechanism, and one specific, an ability mechanism. It proves also that the degree of development of the ability mechanism can be inferred from the results of tests only when conditions have been so controlled that ability is measured under standard conditions; that the only way to make sure that standard conditions have been achieved is to measure the individual

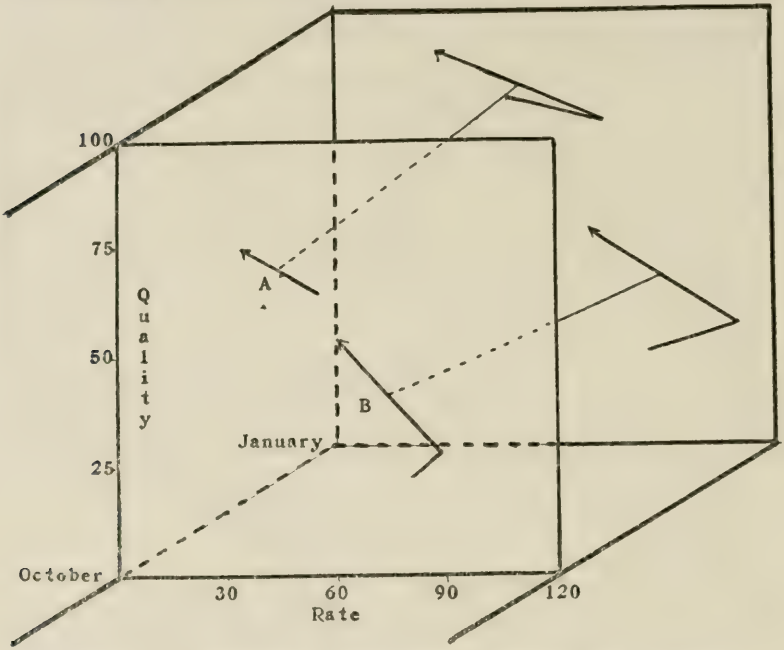


Figure 12.—Patterns of development—handwriting October to January.

under varying conditions and derive ability scores from a knowledge of the total situation; that the emotional and control elements play a much larger part in determining scores than has been suspected; and that the individual standards both for patterns of development and for goals of achievement seem to be desirable.

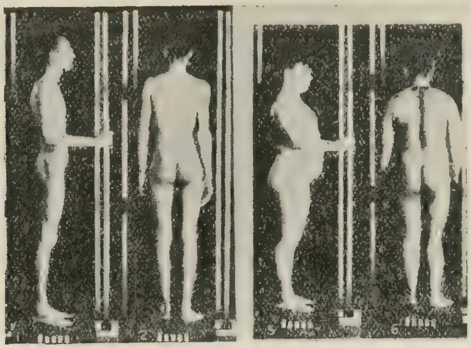


Figure 13.—Extremes of scale for "build"—Davenport.

In our past teaching, only incidental attention has been given to the emotional and control elements. The data presented and other similar studies suggest that in the future, the emphasis in our teaching is likely to shift from the relatively unimportant specific ability mechanisms to the fundamentally important control and energizing mechanisms. In any event, a college professor has fulfilled his function when he has isolated a series of problems and turned them over to the practical agents to solve.

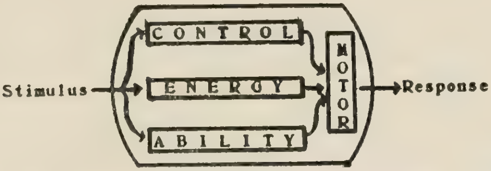


Figure 14.—Factors determining performance—individual.

ELEMENTARY PRINCIPALS

ISABEL R. WILSON, *Principal, Lincoln School, Akron,* Presiding

UNITED LEADERSHIP AND EXPERTNESS IN TEACHING

M. E. WILLIAMS
Principal, Chambers School, Cleveland

One of the most important developments in the field of educational endeavor during the past decade has been the professionalization of the elementary-school principalship. Originally created to handle the clerical, inspectorial, and disciplinary matters of the larger schools, it is now proclaimed as the agency which should exercise not only large administrative control over organization and business affairs of the school, but general supervision of instruction and professional leadership of the teaching corps. Furthermore, it is not now expected that the responsibilities of the principalship shall end with what takes place within the school system, but that its influence shall extend out into the home and community life and there become a vigorous force in the promotion of right standards of living and of social and civic conduct.

Authoritative surveys of conditions existing in the principalship have disclosed that the majority of the incumbents of that office are quite unfit to discharge adequately the duties that the modern conception of the job would assign to them, and especially those duties having to do with the supervision of instruction and the professional leadership of teachers. Chiefly upon the discharge of these duties, rests the relationship of the principal to such expertness in teaching as may be exhibited in his building.

For the purpose of eliminating the deficiencies which are holding back the elementary-school principalship from its rightful position and dignity, and to provide for professional growth consistent with the rapid expansion of educational science and practice, principals are uniting in national, state, and local organizations. The development of a professional consciousness, the agitation for high standards of academic and professional training as entrance requirements to the principalship, the establishment of common ideals, and the creation of a scientifically derived literature bearing on the problems of principals have been among the achievements most effective in generating the increasing activity now being shown toward study and improvement.

It is usually found that the quality of teaching in any school will be considerably influenced by the kind of professional leadership given the teachers of that school. Under an incapable principal, teachers almost invariably do poor work; under an autocrat, they do spiritless teaching; while under a principal who combines thorough preparation with energy and democracy the work of seemingly inferior teachers greatly improves, and talented teachers accomplish remarkable results. Thus an organization among principals will function directly through the teaching being done in the classrooms by reason of its practice of analyzing the qualities that seem to make for most successful leadership and urging their emulation upon its membership.

Probably an organized principalship's greatest contribution toward expertness in teaching would come with leadership so human that it warms the heart and refreshes the spirit of every teacher who comes in touch with it. From a guidance so democratic that it unlooses upon the children all the richness of individuality that every true teacher has within her; so inspiring that in every school in the land will be found principal and teachers going forward together, earnestly, gladly, and devoutly keeping fit to meet the mighty challenge of a constantly readjusting society to prepare its boys and girls to live healthy, well-balanced, worth-while lives, and to maintain loyally and vigorously the highest ideals of this most favored of democracies.

DEMOCRATIC SUPERVISION IN RELATION TO EXPERTNESS IN TEACHING

V. T. Thayer
Ohio State University

The history of supervision reveals two tendencies. A little more than a generation ago professional supervision scarcely existed and instructions for supervisors consisted largely in vague and platitudinous generalizations. As a reaction against this tendency the effort today is to place supervision on an expert basis. In so doing, however, we are neglecting the most significant function of supervision, that of educational leadership. The supervisor, in addition to his technical equipment, should possess a philosophy of education. He should interpret the task of the supervisor to be that of so organizing his work that teachers are encouraged to realize their highest potentialities, all with the final end in view that the school in its organization within and without the classroom shall contribute toward the preparation of boys and girls for an intelligent participation in democratic citizenship. This constitutes democratic supervision.

The paper suggests a number of things a supervisor can do to realize such a program. First, he can teach at strategic points, thus concentrating upon those phases of instruction, weak spots, and new experiments toward which he wishes his faculty to direct their attention. Secondly, he can organize his faculty into committees for concentrating upon problems near to the hearts of his teachers or which will lead to improving the work of the school. Thirdly, he will follow up the work of committees by organizing his office into a reference and research library in such a way that it has available information such as new departures elsewhere, the leading professional magazines, publications of bureaus of research, societies for the study of education and governmental departments. Fourth, he can stimulate the development of his teachers by providing for group meetings at which time reports on work they are undertaking or plan to undertake are made. He should use these reports as a basis for a friendly but critical study of experiments, thus both stimulating teachers to blaze new trails and eliminating half-baked ventures. Again, the supervisor can associate his school with out-of-school agencies, particularly of a research character, which will lead to the introduction of new methods and ideas and break down provincial barriers. Finally, the democratic supervisor who wishes to develop expertness in teaching will attempt to budget the time of his teachers so as to insure them opportunities for professional growth. Growth requires energy and time and what a school system asks of its teachers it should enable them to realize. By thus dedicating himself to the task of providing the essential conditions for the improvement of others the supervisor will necessarily budget his own time so as to insure the most profitable investment of his own efforts.

ELEMENTARY TEACHERS

MADGE L. PERRILL, *Ohio Avenue School, Columbus,* Presiding

PRACTICAL USE OF THE MARIONETTE THEATER

WINIFRED H. MILLS

Cleveland

The marionette theater brings to the elementary teacher an ideal means of stimulating scholarship, craftsmanship, and social relations. It draws upon all the resources of the school—English, art, music, history, geography, manual training, sewing—and even the teacher of folk dancing can lend a helping hand. The pupils discover how to go about getting information. It is always surprising to see how much even a second-grade child can accomplish when he knows what he wants.

A second-grade group gave a delightful and näive performance of a Japanese play, "The Magic Mirror." Inexpensive dolls were used. Pictures of Japanese costumes, country life, and home life were brought to school. Appropriate scenery was made with crayons on wrapping paper. Simple costumes were made and the story was informally dramatized with the class suggesting changes from day to day.

A group of fifth-grade foreign children, who were having difficulty with the English language, dramatized "Heidi" and gave many performances for their school. With intense interest they showed ingenuity and skill in making properties and scenery. The principal commented chiefly on the efforts of the children to speak their lines correctly. A sixth grade gave a remarkable performance of "The King of the Golden River."

Perhaps the story of one small boy will show what the marionette can do unaided. When five years old this boy was given a marionette. He was fascinated by it. Holding it before him he would talk for hours at a time, awkwardly pulling the strings. He was the sole audience for a year. Then he went to school. A new world was opened to him. Much of that world he brought home to his marionette. His crayon drawings suggested to him the making of scenery, the informal dramatization of plays. One day he made a stage by turning a small table upside down. From leg to leg he fastened a cloth, leaving one side open. He produced scenery with his crayons and wrapping paper, pine trees against a blue sky. Cotton batting on the stage floor served for snow. A string of Christmas tree lights was used for foot lights. He placed all the blue bulbs together, then the red, the orange, and the yellow. Several friends were invited to the first performance. The scene was a winter night in a pine forest. The blue lights upon snow and background gave a note of mystery. The little boy bending above his stage was intent upon his play. The marionette came hopping in complaining of the cold. He told where he came from and where he was going. He thought he was lost and decided to spend the night under a tree. The small puppeteer, now telling the audience that sunrise was coming, pulled the rosy lights across the stage. The effect was charming—so charming indeed that he came out in front to enjoy it too. Then back to his place above the stage and the play went on.

When he was seven, another marionette was given to him. He used a box for a stage and worked spare moments with his plays. One day in school he told the children in his class about his marionette theater. They were all eager to see it. The teacher asked him to give a performance for the children. He gave performances for all the primary grades. Now he is helping the children make marionettes for a play that the class will give.

The marionette field is a new and rich one for the elementary teacher. It develops the child's imagination, art, vision, ingenuity, skill in craftsmanship, self-expression through freedom of thought and action, unselfish sharing of responsibility and pride in group accomplishment.

THE PLACE OF ACTIVITIES IN THE CURRICULUM

Lois Coffey Mossman
Teachers College, Columbia University

This is an age of new curricula. Scarcely a week passes without bringing to the attention of those interested in elementary schools one or more new curricula. They vary much in kind, but some characteristics seem quite prevalent. Among these is the tendency to embody in the material the aspect of what, for want of a better term, we may call "the activity theory." Some are avowedly activity curricula devoting much space to suggested lists of activities in which the children may engage in the course of their work. Some describe in detail activities that have been carried on. In a recent visit to a progressive school, the writer was asked to evaluate a long list of suggested activities prepared for a new course of study. Indeed, it would seem that, not "the play," but the activity is "the thing."

What is the basis for this trend? What are the arguments for this interest in stating curricula in terms of activities? The activity of an individual is the response he makes to that which stimulates him. The stimulus is something in the situation or in himself which prompts him to act, and what he does is his response to the stimulus. If this response is satisfying to him, that is, if it fulfills that which he was set upon doing, he becomes more inclined toward such responses in the future. We say that he learns to do this thing, and by this we mean that the connections in his nervous system are more definitely fixed toward acting in this way again. Similarly, if annoyance results, he is less inclined so to respond again. It is seen that this so-called learning is the process of making nerve connections. It takes place only as there is activity. The individual learns by doing only as he does and he understands what he does. It would seem reasonable then that a curriculum could state the contemplated learning in terms of possible activities.

Examination of present-day statements of child nature seems to bear out the reasonableness of such a curriculum of child activity:

> The child is already intensely active and the question of education is the question of taking hold of his activities, giving them direction. . . . He is already running over, spilling over, with activities of all kinds. . . . Learning? Certainly, but living primarily, and learning through and in relation to his living.[1]

The dynamic of this activity is in this continuum of doing. Education is seizing upon the numerous drives to do and guiding them into worth-while learnings. It begins at the level of the child's interests. Through the doing it results in learnings making for activities on a higher level. Thus the curriculum in terms of children's activities will resolve itself into a series of activities of increasing significance but always on the level which will utilize the child's drive to action.

The guidance which the teacher must give in order that the action be worth while, must take place either through modifying the things which are stimulating the child to action or through strengthening or weakening the satisfactions attendant upon the activity. The child's activity is a response to what stimulates him. These stimuli come largely from the environment as his nature is selectively responsive to these stimuli. The school is unique as an educational institution, as Professor Dewey has pointed out, for it controls its environment so that the environment may, first, be simplified and thus be better suited to the child's learning right responses to significant stimuli; second, be purified and thus cause the child to form habits of responding to desirable stimuli; and third, be balanced and thus insure the child's forming habits of responding to the stimuli which make for wholesome, well-ordered living. In the proper control of environment and through the proper selection of activities, these ends may be accomplished.

What is the source then of these activities which are proposed as the basis of learning? If the real function of education is to make the obvious and the commonplace more meaningful, we find that living richly and fully is the basis of the desired learnings. This means a somewhat changed conception of schoolroom procedure. The school becomes, not a place of merely doing set tasks, but a place where boys and girls are living together and sharing experiences.

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[1] Dewey, John. *The School and Society.* Second ed., University of Chicago Press, 1921. p. 37.

If the schoolroom living is to be truly living, there are certain essentials which must be recognized:

1. Group consciousness must be developed. The individuals must come to know each other. They must recognize the elements of individual strength which may be used in group enterprises. They must be aware of the possibilities of group activity in which they can engage.

2. There must be the setting-up of definite, conscious objectives by the group. The formulation of the things to be done during the year should be one of the first matters to receive the attention of the children. The first grade of Horace Mann School, taught by Miss Jean Betzner, set up these objectives last fall:

Make a dolls' town
Make trucks
Make automobiles
Make dolls' dresses
Wire houses and stores for electric lights
Learn to read
Learn to write
Make cocoa
Learn to cook
Hear stories.

A third grade in the same school, taught by Miss Mary Lewis, proposed the following:

Read many books
Improve our spelling
Learn new songs
Work with wood
Improve our arithmetic
Give a play
Make clay bowls
Make a yearbook
Improve our manuscript writing
Paint at the easel
Have a Story-Hour Club
Write stories
Write poems
Have a neat room
Study history
Have class meetings
Learn about maps
Have a library
Go to wholesale market
Improve our art work
Have a newspaper.
Study geography

This third grade, the following year, under the leadership of Miss Bess Young, set up these objectives:

Make our room attractive
Make greeting cards
Make booklets
Keep a diary
Dye cloth
Use a dictionary
Have tests
Study maps
Make yearbooks
Take trips
Know about scientific facts
Study Greek mythology
Take care of our Christmas family
Study silk
Study bees
Write compositons
Write poems
Have a play

The eighth grade taught by Miss Maloney, in the State Normal School at Milwaukee, Wisconsin, also deserves mention. As the year's work the pupils of this grade definitely undertook to edit and manage the school paper, to have a Learn to Live Together Club, to give a Christmas play, and to organize a School Court. Out of these activities came needs for thorough mastery of much subject-matter.

Such objectives, once stated, may be modified as group consciousness of possible activities grows and as group ideals become modified. They provide a criterion for evaluating individual proposals and for judging the worth of individual contributions to the group experience. Responsibility for carrying out definite purposes is gained by such a procedure.

3. If these objectives are to be realized by class effort, a program of action will be necessary. Such a program must assign time in such amounts and for such uses as will make results possible. The terminology used for naming the various periods of time is of no great concern. The use of conventional names often is wise as a means of holding the confidence of the more conservative element in a community. The children, however, should clearly understand the purpose and importance of each period in terms of its contribution to the attainment of class objectives. For this reason attention must be given by the class to making and evaluating the class program.

4. Similarly there should be provision for very careful check that the class may know the progress it is making toward its goals. This check may be in terms of standard tests where such are available, and in terms of summaries, charts, tabulations, reports, yearbooks, and criticisms. The check should be made by the members of the class.

5. The means of such activity should be available, but this does not mean elaborate equipment. It would be better to have less-finished, inexpensive equipment that would admit of its flexibility in its use with modification or improvement by the class as need demands. There must be freedom to initiate, to plan, to modify routine procedure, to do what seems wise to further the class goals.

6. This calls for a method of living together as a group—pooling, sharing, initiating, planning, proposing, cooperating, evaluating, discussing, judging, deciding, summarizing. Both individual and social learning is thus possible.

The teacher who attempts to work with such an activity theory finds herself in constant need of criteria for evaluating proposed activities. The following questions are offered as indicative of the sorts of criteria the teacher should use in exercising responsibility of guiding the children in their selection of the activities in which they propose to engage:

1. Is is related to the present living experience of the children?
2. Does it give promise of outcomes relatively valuable in life today?
3. Will this work contribute to some of the larger essential goals of education?
4. Will it give fuller meaning to the experience of the child in this particular environment?
5. Is it hard enough to challenge?
6. Is it easy enough to insure some degree of success?
7. Will it lead on to something more worthy?
8. Does it come out of the children's previous experience?
9. Will it foster an investigative attitude?
10. Will it teach the children method in ordering their experiences?
11. Will it develop relationships leading to organization of experience?
12. Is the experience involved socially constant or socially variable?
13. Are the fields of subject-matter involved worth while, representative of the big aspects of life?
14. Is it related to other activities of the children?
15. How often and how recently have similar activities been experienced?
16. Will it contribute to the child's efficiency?
17. Is it in line with the theory of increasing difficulty?
18. Is it practicable under school conditions?
19. Are materials and helps needed available?
20. How fully can the activity be carried out?
21. How much time will it consume?
22. What difficulties may arise in carrying it out?

Many practical questions arise as to the sort of curriculum such a program of living and learning demands.

Will the curriculum be in terms of a list of suggestive activities?

Will the subject-matter needed be stated?

Is subject-matter a constant or a variable? Can we list the constants at present?

Will the curriculum list possible class objectives?

Will it state desirable outcomes in specific details?

Will the curriculum give abundant bibliography designed as suggestive sources of material for enriching the work?

What aids to work are needed in the way of maps, globes, reference books, class library facilities, and tools?

Will the curriculum indicate ways in which the children may meet these needs?

In general shall the curriculum be prescriptive or full of suggestions so abundant that the teacher is of necessity forced to make decisions as to which of these are the better?

Will such decision promote a better quality of guidance of the work of the children in living and learning together?

In answering these questions time will be needed for careful evaluation of their implications. Radical departures from the customary do not necessarily prove the surest ways of bringing about growth. The tendencies of recent education to consider learning in terms of children's activities call for a curriculum which will permit initiative and flexibility in the work of the children and teacher.

THE DEAF CHILD IN THE ELEMENTARY SCHOOLS: THE ECONOMIC AND EDUCATIONAL ASPECTS

Harold Hays
League for Hard of Hearing, New York City

I am very much complimented by the invitation that has been extended to me to address you. Two thoughts come to my mind, first, How many of you would have been interested in a subject of this kind as short a time as ten years ago, and secondly, How many of you would have believed that such a subject could be presented in an interesting form by a physician?

The drama of life is being enacted before us every day in the year but usually by grown people who work out their own problems. We do not look for the dramatic in children's lives. We usually think of their little problems in terms of joy and happiness. Yet the deafened child presents a dramatic problem which, unfortunately, is too little recognized, with the result that when the child grows to manhood or to womanhood, the drama ends in tragedy.

I wonder, if you could look into the darkened souls of these deafened little children, often hidden behind the mask of innocent and unconscious happiness—the blessing of every child—whether you would not be amazed to see all the heart-aches Often the child does not know he is hard of hearing but thinks himself stupid because he does not get along as well as the other children. The result is that he develops an inferiority complex. Often he feels that he ought to hear the teacher, but the teacher may not be speaking clearly. How is he to know that he does not hear well enough to get along like the other children? He thinks of the ear as a piece of skin, with many folds, that hangs onto the side of his head. To him it has no other purpose. Only after years of endless strain on the nervous system, it is found that the hearing mechanism has been at fault.

The problem of the educator at present day is to nip deafness in the bud so that the child may be able to advance normally with his classes. On the face of it, the average educator who does not know the facts would say, "Why should we bother with a problem of this kind when we have so many other more important things to deal with?" Ten years ago, I might have agreed, but certain facts have come to us through endless investigation which makes me feel that there is no problem of the school child which needs greater cooperation of the teacher, the physician, and the parents not only because of the great prevalence of this trouble, but because it is an ailment which can be prevented and if not prevented, is an ailment for which proper provision can be made.

Let me present a few facts which will make you realize the importance of this subject. Fowler and Fletcher state that recent surveys of the hearing of school children in the United States indicate that more than three million have hearing defects. In one school in New York City in which tests were made, the investigators found that of 4,112 pupils tested, 595 or 14.4 percent had deficient hearing, 3.2 percent defects in both ears and 11.3 in one ear only. The tests were based on what they call a loss of nine sensation-units or approximately two-fifths loss of hearing distance. From the educational point of view, particularly as it effects the elementary teacher, such facts should make one reflect very seriously. Not only does every child who has a hearing defect mean a certain retardation of the whole class, but it is necessary to repeat certain tests so often that the wear and tear on the teacher make her apt to think that she is dealing with a stupid child rather than with one who has the misfortune to misunderstand because he cannot understand.

Let me present this problem from another point of view. Every teacher hates to feel that she has "repeaters" in her class. Frequently she questions her own efficiency. Often, however, these repeaters are children who do not hear well. From the point of view of the teacher, the child, the parent, and the tax-payer, these repeaters are an important economic problem. A survey made by Mrs. James F. Norris showed that in one school there were 137 children who were hard of hearing. Of these, 48, were up to grade; 38 repeated once; 26 repeated twice; 16 repeated three times; 7 repeated four times; and one repeated five times. Bock reports from Rochester that 57 children repeated 66 classes; 441 repeaters cost the city $26,460. It might be worth while to investigate how much Columbus pays for its repeaters and how many of these repeaters are deafened children. I am sure that you would find the cost far less to restore these children to useful lives, both by special care in school and medical attention than the cost of carrying them on the rolls of the schools as you do today. I am anxious to emphasize this point because, in the majority of cases, those who rule can be approached through their pocket-books better than any other way. Bock states that "much of the economic loss to our school system may be prevented, and the whole future of the child be placed upon a higher plane of social and industrial efficiency by spending a little money and using a good deal of ordinary common sense."

For hundreds of years there has been an interest in the deaf child, whose need of special care makes him a state problem. The poor unfortunate who has diminished hearing but is not a total loss, however, has always been an educational and social outcast. The only consideration he might possibly have received has been from those who have been intimately associated with him. I say "possibly" because often this deafened child who should receive the most consideration at home, is considered an oddity and thrown into the corner to commune with himself. The school problem is a recent one, and it might be interesting to learn how we came to think of this problem at all.

In 1913, I was working at the New York Eye and Ear Infirmary where day after day, an endless number of deafened people applied for treatment. This was given in a perfunctory and routine manner. It occurred to me that these people had a home problem, an economic problem, a social problem. All of them seemed more or less depressed. Most of them felt that their trouble had come on them in childhood but was unrecognized until adult life. Many had left school at an early age because of inability to get along in their classes and felt that school was not worth while. Shortly after that I organized the New York League for the Hard of Hearing starting with a nucleus of graduates from the Nitchie School for the Hard of Hearing. The late Mr. Nitchie apparently had had the same idea, and his alumni had started welfare work of the same sort some years before. I was president of the New York League for nine years during the first few years of which we devoted ourselves almost entirely to work on the deafened adult. Feeling, however, that we had been placing the cart before the horse, I began soon after the war to work with the deafened child. Work of a similar kind had been most efficiently done in Rochester by Dr. Bock under the severest of handicaps.

The problem as I saw it, was this: First, the deafened child was not being properly treated medically, and second, he was not being properly handled in the school. I organized a Clinic for the Prevention of Deafness in Children under the auspices of the League. The social workers at the League sought permission from the school authorities to weed out the children who were supposed to have hearing defects. These children were sent to my office where my associates and I treated them like private patients. Aside from the medical examination and treatment, we gave advice to the schools as to the best disposition of the children. During three years, we treated over five hundred children, giving over five thousand treatments. We improved, or cured, over sixty percent of them; and those that we could not cure, we were able to place properly in special classes or schools. When we summarized our work, we found that some good had been done for a few children, but that it would be impossible to reach many until we had the cooperation of the school authorities and the philanthropists who were interested in child welfare. Although we had treated five hundred children, what was to be done for the thousands that we could not handle? We have been working on this problem for four years and at last are getting to the stage where the future promises much.

The New York problem was really a national problem. In every city and small community in the United States, there are deafened people. The only thing to do was to form a national association which has been named the American Federation of Organizations for the Hard of Hearing. This organization was successfully launched under the presidency of Dr. Wendell C. Phillips, now president of the American Medical Association. I was elected its second president, and the Federation is now manned, most successfully, by Dr. Gordon Berry who is himself deaf. Although we are greatly interested in the problems of the deafened adult, our chief concern is for the deafened child of school age who is mainly in your keeping during those tender formative years which will either make or break him during his life struggle.

As I stated before, Dr. Bock, of Rochester, has tried for many years to awaken the school authorities. Dr. Phillips, Dr. Fowler, and Dr. Fletcher, in New York; Dr. Max A. Goldstein, in St. Louis; Dr. Horace Newhart, in Minneapolis; and Dr. Norval Pierce, in Chicago, have devoted a great deal of attention to the school child, and they have come to certain conclusions which promise well for the future. I should be remiss if I did not mention that it would be impossible for us to do anything were it not for the painstaking work of social workers and teachers who are interested in this problem, chief among whom is Mrs. James F. Norris, of Boston, who has consolidated and coordinated the work of the various investigators throughout the country.

The chief interest to you is what to do with the deafened child in your own classes. If you are like most teachers, you have paid little attention to this problem in the past. Even at the present time, have you been educated to sympathize with the deafened child? Even if you do know his problem, do you know how to handle it? It is not sufficient to know that a pupil is deaf; you must know how to give the child the advantage of learning what you want to teach him.

The subject divides itself into two parts, the medical problem and the educational problem. The educational problem divides itself into the determination of the hearing defect, which is also often a medical problem, and the placement of the child.

The medical problem has to deal with two factors, the prevention of deafness and the treatment of the deafened child by the most modern methods. Newhart states that the most effective measure for preventing and arresting hearing impairment is found in the application of such methods in the form of regular periodic examination for the purpose of detecting even slight hearing loss which, in many cases indicates the presence of pathological conditions which are likely to cause further and probably serious deterioration of the organ of hearing. In 1921, I stated that too much attention had been paid to the acute otologic conditions of childhood; too little attention had been paid to the chronic otologic conditions or, at least to the causative factors which bring about deafness in later life. The cure of an acute suppuration from the ear may mean the saving of a life; but is that of any more importance than eliminating factors which, if left uncared for, will mean the leading of a life of misery? I might add to this the question, Is anything of more importance to the deafened child than the curing of a hearing defect which points him out as inferior?

The medical problem is a question of preventing hearing defects and restoring hearing loss. This statement is simple and direct, and no more need be said about the medical problem beyond asking the question, How are the physicians to get hold of these cases and study them if they do not have the proper cooperation of the teacher who should be the first one to note the trouble?

How is the teacher to determine the hearing defect? After a thorough study of this subject, it has been decided that it would be humanly impossible to examine all school children at periodic intervals by the ordinary time-worn methods. The teacher may pick out one individual child who does not seem to hear well, or she may "spot" a running ear. She should see that such a child receives proper attention. As stated before, 14.4 percent of the children in one school were found with defects of hearing which necessitated preventive measures. One might discover many children with defective hearing by testing them with the voice, whisper, and watch; but he could not discover all.

We have had the cooperation of the Bell Telephone Laboratories under the direction of Dr. Harvey Fletcher, and within recent years there has been devised the phono-audiometer which, to my mind, is the greatest invention for the detection of moderate loss of hearing which has yet been devised. This instrument has been used in the schools of many cities by Dr. Fowler, Dr. Fletcher, Dr. Franklin W. Bock, and Dr. Horace Newhart so that we are now in a position to attest its merits.

The phono-audiometer is a combination of a phonograph and telephone system whereby the record on the phonograph can be heard by a group of children through telephone receivers. Groups of twelve to forty children can be tested at one time and, according to Fowler and Fletcher from 75 to 150 children can be tested in one hour, taken in groups of forty. The record on the phonograph has a gradation of a male and female voice from loud sounds to soft sounds, mainly numerals. The children are given sheets of paper which contain spaces in which to record what they hear through a telephone receiver connected with one ear and attached to the instrument. After one ear is tested, the same procedure is tried on the other ear. The papers are then examined and the percentage of hearing loss reckoned by determining the number of sounds which were heard inaccurately or not at all. Those children whose hearing falls below a certain percentage are examined more accurately and, if necessary, are given special treatment.

Aside from the advantage of speed, the phono-audiometer has the advantage that it can be handled by any intelligent person. It is most encouraging to think that we are now in a position to have hearing tests made on school children in a simple manner and that the tests can be repeated from time to time with so little trouble. I agree with Newhart that the only way to prevent serious deafness is to detect it in time and that this can best be done by periodic examination with the phono-audiometer. He states:

> In the diagnostic ear clinic a careful ear examination is made with the phono-audiometer of all children whose hearing test falls below a certain predetermined grade. The results of this examination are transmitted by the school nurse to the parents, together with the recommendation that the child requiring treatment or operation be taken to the family physician who may treat the case himself . . . . or refer it to an otologist . . . . or to one of the clinics. . . . . To conserve . . . . the hearing of the greatest number of our population, the idea of regular systematic examinations of the ear must be extended to all educational institutions, the private as well as those supported by the public.[1]

Within the past few years, thousands of children have been examined with the phono-audiometer but, apparently, this is but a small proportion of the children having hearing defects. The seriousness of the matter is expressed concisely by Mrs. James F. Norris who says:

> For educational purposes, it is necessary to know whether a child is fully understanding all that is being said to him and around him in the classroom; in other words, whether he has any hearing loss. Recent investigations have brought to light the astonishing fact that many children thought to be hearing all that was said to them, have not fully understood and that others adjudged of dull mentality were dull only because the hearing was dull.[2]

The placement of the hard of hearing child is an important matter in which you should be vitally interested. These children may be divided into groups as follows: (1) The mildly deafened child, (2) The moderately deafened child, (3) The very deafened child, and (4) The hopelessly deafened child.

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[1] Newhart, Horace. "Diagnostic School Clinic in the Public School as a Factor in Conservation of Hearing," *The Journal of the American Medical Association.* 87:1884. December 4, 1926.

[2] Norris, James F. Chairman of the Committee on the Survey of Hard of Hearing Children, *in* a report to American Federation of Organizations for the Hard of Hearing. January, 1927.

The mildly deafened child should be kept in the same classroom with the other children, but he should be given a front seat. The teacher, however, should not forget that this advantage means nothing if she wanders around the room and asks questions behind the child's back. The teacher should remember that such children are sensitive and easily discouraged. A smile and a pat on the back will do more good than constant scoldings and frequent punishments.

The moderately deafened child cannot get along in the classroom unless special provisions are made for him and unless he is aided by proper medical treatment and special instruction which should include lip-reading. Most deafened children are natural lip-readers; and, if they are not, master the art very rapidly.

I wonder how many of you know the wonders of this art? It, no doubt, is the greatest boon to the deafened child of which we know. In fact modern work for the hard of hearing, according to Dr. Gordon Berry began in America when, in 1857, deaf little Jennie Lippit, the daughter of a Rhode Island governor, was the first to receive training in this art. He then adds:

> The grade teacher often has to deal with the complicated problem of a child who cannot quite distinguish what she is saying. He can hear much of her conversation, but may lose the keyword of a question or a sentence. Cumulative errors may lead the teacher to the conclusion that the child is stupid. This reacts on the child and makes him embarrassed and reticent. A sense of isolation begins to take hold of the child. When the time comes for him to advance a grade, he is not ready to go on. . . . An economic and social problem has developed. . . . Over against this dark picture may be placed the experience of forward looking educators. They find that a child learns lip-reading easily. . . . that the training can be given by normal-trained teachers with a relatively short period of added training. . . . that with this help, the children can and do keep up with their classes and in many instances, graduate with honors.[3]

The mastery of lip-reading must often be left to another teacher, but children do not have to miss their regular classes because of this. They can be given instruction in lip-reading a few times a week after regular hours. I am happy to say that many departments of education in various cities are making provision for lip-reading teachers.

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[3] Perry, Gordon. "The Deafened," *Hygeia*, 4:687. December, 1926.

There are certain cases in which it is better to send the very deafened child to a special class under the direction of a special teacher. Such classes should be maintained in regular public schools, and the children should be made to indulge in all the activities that the other children do. It is important that these children be encouraged at home and made to feel that they count for as much as other members of the family. It is unfortunate that many are not given a square deal with the result that they develop inferiority complexes.

There are certain children whose hearing defect is most apparent.

> A large degree of deafness proves at once a help in the fact that the handicap is recognized and proper educational advantages are given. But when a child hears almost all, yet is losing degrees and kinds of sounds, he frequently presents a baffling problem until the hearing test given to all has brought out his defect.

Children in this class must be sent to a special school for the deaf which should be part of the general school system. It is manifestly unfair to them to try to teach them with other children, and it is far from economical to retard a whole class, because one or two handicapped children cannot be reached.

I have dealt with this large problem in a general sort of way, hoping that I may drive home certain points which will help you in the teaching and treatment of these poor unfortunates. If each one of you will consider the hard of hearing child from the human point of view and try to approach him as an individual, you will accomplish much. Try to feel that you are not only dealing with a deafened child but with a potential adult who can lead a life of misery or happiness, depending upon the way he is handled during the plastic years of childhood.

ENGLISH

JOSEPH V. DENNEY, *Ohio State University*, Presiding

DEALING WITH INDIVIDUAL DIFFERENCES IN ENGLISH TEACHING

S. A. LEONARD
University of Wisconsin

To remark that enormous differences exist in the preparation and in the capacity of students who come to our English classes in any year of the high school is commonplace. In whatever way they are tested, ranges of ability are found over as many as twelve school years. I have never given a reading test to high-school Freshmen without finding one or more students below the fifth-grade average achievement and one or two more above the average for superior adults. This is typical of what is to be found in any other phase of the subject—ability in composition, in form, and in appreciation of poetry. These differences no doubt correspond roughly to the results of so-called intelligence tests which are actually a measure of achievement based upon both native capacity and opportunity.

Many methods have been suggested for dealing with this perplexing problem; certainly it is not met by assigning "the next ten pages" or "the next chapter of Ivanhoe" to all alike; the results of such procedure are unsatisfactory to all of us, and we are searching for better ways. The sectioning of classes according to intelligence quotient, reading ability, or a combination of tests is one solution. This is only a partial remedy, however, for even in sections so provided there are great differences of level from the beginning, and in spite of all efforts the differences grow greater rather than less. Even the differentiated sections with division lines fluid and constantly changing, the problem of individual variations in ability must be met.

In certain matters, particularly of form in English composition and of skill in reading, a great deal can be done by means of properly prepared individual-instruction material. The free conditions of work in the country school used to make more of this sort of work than we have done elsewhere until recently, and even in the country school this beneficent arrangement has been broken down until schedules of ten-minute periods have sometimes taken its place. It is excellent, at least occasionally, to have the English class conducted as a laboratory in which everyone works on problems in which he needs particular help. In such a procedure the teacher is a busy person, if he is doing his work, and can find out and help remedy more specific disabilities and misunderstandings than in any other way.

The chief way in which we are at present trying to help with this problem in the Wisconsin high school and in other places is by means of assignments on different levels. With us, pupils from the lowest to the highest achievement scores are in general kept in a single section, as they must be in the small school, but assignments are devised as far as possible to meet the needs and possibilities of everyone.

In the first place, there are what we may call the "least common essentials" in each school year—the minimal abilities in reading comprehension, in simple practical composition, and in the literature which all the class read together. In laying out these minima, as in all programs of essentials, it is difficult to select few and simple requirements. For the standard of achievement demanded here is full mastery—not 70 to 75 percent of what is assigned, but at least 90 percent. We consider that an especially important matter of intellectual honesty is involved. When a pupil is given a great deal of perplexing work to do knowing that he will pass if he does about 70 percent of it, he has little help in directing his energy; but if the requirements are few and definite and he knows that he is going to be held for them, he can buckle down to a job near his size and get the satisfaction that comes from conquering one thing at a time. By constant revision of these common essentials, we can make assignments which are actually possible for every normal intelligence if enough energy is applied by teacher and pupils.

This is good for the lower levels of ability in the class, beside being excellent discipline for the best people. But it is essential also to have a great deal of fruitful occupation for the more rapid and brilliant workers. Of course, it might be possible theoretically to let these pupils put their time on other subjects, or on speeding up their progress through the high school. Something of this sort may in time be done, but it is equally important to give these people greater depth of experience and greater reach and swing as they go along. Hence came the proposal, first presented by H. L. Miller,[1] that additional incitements and opportunities for good work be provided outside the essentials; that for a grade of excellent in the essentials only, a final mark of only passing or fair be given; and that for final marks of good and excellent, real achievement in these additional assignments be required.

All of this is distinctly in an experimental stage, but it seems to promise real gain in both genuine mastery in pupils of various levels of ability, and in providing opportunities for worth-while achievement beyond that level for the better people. Properly, such assignments should be more in the form of projects designed by the pupils themselves, or merely suggested by the teacher, than of arbitrary requirements. It is desirable that alternatives and opportunities in initiative for the pupils be provided even in the essential requirements. Nevertheless, the guidance of the teacher is essential throughout.

Extra work in English classes consists of a great variety of worth-while reading outside the minimum class list, of varied composition activities up to the level of individual creative work, and often of assistance to poorer students who have not yet achieved the minimum standard. Various numbers of the *English Journal* and of *Tri-State English Notes* have discussed numerous plans on this order. Every such scheme should be tested for provision for genuine opportunities in worth-while extension of activities and interests.

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[1] Miller, H. L., and Johnson, Dorothy. "Directing Study for Mastery," *School Review*, 30:777-86, December, 1922.

GEOGRAPHY

C. E. Cooper, *Ohio State University,* Presiding

THE GROWING NECESSITY OF HIGH-SCHOOL GEOGRAPHY

W. R. McConnell
Miami University

No trend in education could possibly be more comforting to geographers than that which is unmistakably indicated in the present curriculum. If educators raise the question of the value derived from the study of any particular subject, they are likely to ask how the subject in question can contribute to social needs. The dominant idea in the choice of curriculum materials seems to be training for citizenship and meeting the needs of contemporary society. Geography will be given an increasingly larger place in the high school in proportion to which its content material and its method contribute toward the application of fundamental processes to simple scientific and social phenomena and to a better understanding of the significance of large group relationships of the world today.

In curriculum revision the high schools are being carefully studied. The importance of such study is apparent to anyone who reflects that comparatively few young people extend their school life beyond the secondary school. This investigation of the high-school curriculum will most certainly result in a relocation of the emphasis given to the several subjects. In the future high school, the studies will not be chosen because they prepare a few for college but because of their actual, practical value to all.

Geography in its deeper significance cannot be grasped by pupils below the high-school age. I am certain that we have made a mistake in assuming that the children in the intermediate grades could intelligently understand, appreciate, and interpret human responses to geographic conditions. The notion that the subject can be covered in the elementary school must surely be built upon the old concept of locational and fact geography—a geography that would involve only memory.

To assist in analyzing and interpreting economic, political, and social problems there is need in the high school for the formulation of geographic principles—principles governing the location and growth of cities, the temperature of regions, rainfall and its distribution, crop production, the fixing of the level of the standard of living, the location of manufacturing plants, soil formation, the location of trade routes, and whatever others are needed for the continuing orientation of the pupils. These should be mastered by using them in the solution of problems. If effective thinking is to take place, whether it be at the level of the high school or in adult life, a body of principles must be well codified and systematized. Only in so far as a complete organization of principles has taken place, will the student's knowledge be available for use.

Geography is needed in the high school to enable the pupil to read intelligently and to comprehend his history work. The necessity of a geographic background for history is being more and more appreciated. Of course, we have a new history—a history that portrays human activities against a background of geographic conditions.

Perhaps, in the reorganized high school, the teacher of geography will also be the teacher of history. Such an arrangement is certainly better than to require the geography teacher to teach typewriting or Latin. Wonderful possibilities exist for the correlation of history and geography. Local history should consider the geographic setting of the city, town, or community, and the location of the factories, roads, or railways, together with the geographic reasons for the same. Immigration into the city should be correlated with the geography of the land from which the immigrants come, and the reasons for their leaving it. The history of the state should be correlated with geographic influences affecting the progress of man within the state. This, in turn, necessitates an appreciation of the influence of outstanding features, such as location, topography, waterfalls, minerals, and resources. The history of the preservation of the Union should be correlated with the study of geographic influences in northern and southern social progress.

Geography is needed in the high school to give the pupils an abiding and effective interest in peoples of the earth. It is the one study that should do most to reconstruct the high-school pupil's experiences and so permit him to enter fully and humanly into the activities of men in different regions. It should show the rights of each group by revealing the services which that group renders to all other groups.

Geography is needed to illuminate one's general reading. Such significant events as the Mississippi flood, the repeal of prohibition in Norway, the McNary-Haugen bill, the ability of European countries to pay their war debts, and the stirring events in the Far East, if they are to be intelligently understood, demand the knowledge of geography.

WHAT SHOULD JUNIOR HIGH-SCHOOL GEOGRAPHY BE AND HOW MUCH TIME SHOULD IT HAVE?

MAUDE MARTIN
Cleveland Heights Junior High School

In making a course of study one is guided by those principles which are considered basic in all curriculum making and by the recommendations made for particular groups of subjects. Although different in some respects from other social subjects, geography is usually grouped with social studies. Just recently a committee of the National Education Association[1] has made some helpful suggestions regarding courses of study in geography, history, and civics. They urge that, first of all, objectives be scientifically determined which are in accordance with accepted aims of education in general and with the aims of the junior high-school in particular. They then recommend that subject-matter be selected which furthers these objectives. While the committee does not make definite recommendations for a course, there is an insistence that knowledge of facts is only one factor in the educative process and that the training for definite attitudes and the development of certain habits are of tremendous importance.

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[1] Report of Social Studies Committee, Fifth Year Book of the Department of Superintendence, Washington, D. C., National Education Association, 1927.

One hears much of separate courses, fusion courses, and unit courses in geography, history, and civics, but, if one is guided by the committee's report, this is less important than the choosing of materials to accomplish certain objectives. Because of the inherent objectives of geography, units of work from this field could profitably engage the pupil's time for a year whether in separate courses or a unified course. The work should be outlined under a selected list of units or large problems which use the economic and political problems as the starting point. Through these units the students will acquire a body of knowledge consisting of facts and principles that will help to build up desirable attitudes and that will assist in the forming of worth-while habits and skills.

At present, little scientific data exist to indicate which facts should be taught. Through the year's work, however, it is desirable to leave a general impression of interdependence of people and nations; an understanding of the gradual growth of the United States and other countries through various economic stages; a knowledge that methods of earning a living and social and economic conditions are not static, but are related to geographic environment; and an appreciation of the fact that as economic conditions change, our trade relations change.

The importance of developing a course which gives breadth of outlook, depth of insight, and a definitely sympathetic attitude cannot be overemphasized. Since man's conduct is influenced by his emotions, his passions, enthusiasms, and prejudices, is it not vital to train the emotions as a means to better civic behavior?

These things may be accomplished by a study of the United States and its world relations. People will be the central figure as in the other elementary-school studies, but instead of merely emphasizing the reasons for the distribution of life in different regions, geography goes further and shows the relationship among the different regions. We attempt to give a broader information concerning the home country and the countries with which we transact business. The economic aspects of the life of the people may be analyzed.

A regional study of the United States and of competing and supply countries is desirable. The United States may be divided for study into three large units as follows:

1. The industrial East
2. The more evenly-balanced Middle West and South
3. The young regions of the Western Interior and Far West

This leads to a study of the different types of environment as they affect the different ways in which men earn their living and will mean an acquaintance with natural resources, the distribution of useful products and the need for conservation.

As each part of the United States is studied, regions having similar types of work may be located in other parts of the world to show competing countries, or, if there is need for a particular product in a region, areas of production may be studied. Thus other units would include:

4. Tropical supply regions
    - Carribean countries
    - Tropical islands
5. Competitors in manufacturing
    - Northwest Europe
    - Japan and Eastern manufacturing regions
6. Competitors in farming and supply regions
    - Canada
    - Russia and the Danube
    - Australia
    - Temperate South America

Such a course gives the pupils an opportunity to see society at work in industry and in the conquest of nature.

It enables the pupils to see people living in a variety of ways and realize their independence. It affords opportunity for developing desirable attitudes, skills, and habits, and illustrates the differences in historical and political background. This course meets the generally accepted objectives of education and of the junior high school and will serve either as a separate course in geography or as the unit of work to be prescribed for the first one of a three-year course.

POSSIBILITIES FOR TEACHER TRAINING IN GEOGRAPHY IN OHIO EDUCATIONAL INSTITUTIONS

JAMES L. LAPOE
Ohio State University

This paper is an abstract of a study made to ascertain what provisions Ohio's higher educational institutions are making for training teachers of geography. A list of ten questions was sent to thirty-eight colleges, universities, and normal schools in the state. Five of these were state institutions. Twenty-nine schools, four state and twenty-five nonstate, replied. Of these twenty-nine, thirteen nonstate institutions said they were doing no work in geography. This leaves four state and twelve nonstate schools that reported some courses in geography.

Eight schools employ one or more full-time teachers of geography. Three employ one such teacher; four, two teachers; and one, seven teachers. Fourteen schools employ one or more part-time teachers. Nine of this number employ one part-time teacher; two, two teachers; and one, four teachers. Most of the geography courses are content courses, principally courses in commercial geography. Comparatively few courses in geography are either professional or professionalized courses. Three semester hours is the usual requirement in geography in these sixteen institutions. The number of semester hours offered ranges from 2 to 50, with 19 as the median. The number of semester hours required for a major in geography ranges from

18 to 30, with 23 as the median. The number required for a minor ranges from 8 to 18, with 12 as the median. As a rule, the state institutions both offer and require more work in geography than do the nonstate schools. The number of students majoring in geography who are graduated each year ranges from 1 to 15, with 3 as the median number, while the number minoring in this subject ranges from 4 to 30, with 12 as the median number. Eleven of the sixteen schools report that they have more students doing work in geography this year than in recent years—the average increase is 20 percent.

Inspection of the data, which have been briefly summarized in the preceding paragraph, indicates that there is comparatively little teacher preparation in this subject so far as these institutions are concerned. This is true whether we consider either the amount of work required or the number of students enrolled in the courses. Whether more attention should be given to teacher training in geography is more or less a matter of judgment. The content of geography can have, and should have, social adaptation and application as well as commercial or industrial in order that it may be more humanized and more closely articulated with life activities in the development of civilization. If geography has anything to offer which will lead students to have a better understanding of, and an appreciation for, the interrelationship and interdependence of communities and nations, and if it can be so presented, then we need its contribution.

The older method of a formalized, logical organization of subject-matter, presented usually as a mass of factual information, could hardly have such outcomes as have been suggested. The newer psychological, functional organization, centered around life problems, and presented so as to show how geographical factors have influenced their solution, or partial solution, seems to promise better results than the old achieved. One of the best examples of such organization is the new Baltimore Course of Study in Geography for Junior High Schools. The writer is inclined to believe that school administrators and the public generally—accustomed to the older organization and presentation of geography and unacquainted with the newer procedure—may help to explain why so little attention is given to specific training of prospective teachers in this subject. If this be true, it seems to follow that one duty of geography departments, particularly in the state institutions, is to convince the public that the material of the newer geography is vital and that it is being humanized. With such a conviction should come a demand for more teacher training in this field. The opportunity for the development of geography in Ohio seems to be large. The future will tell how this opportunity has been grasped.

TEACHING OTHERS TO STUDY GEOGRAPHY

WALLACE W. ATWOOD
President, Clark University

When training children in the study of geography, the significance of imaginary journeys should be emphasized. They are naturally interested in the children living in the different parts of our country and in other lands and would love to visit their homes. This method of journey geography, I endorse for the early stage in training others to study geography.

It is possible to present the geography work with connected problems. While children may be interested in simply learning about different peoples, they soon will raise the question of "Why?" and the problem method of work may begin. Hand-work should be introduced into these early lessons. Models of homes in distant lands may be constructed; means of conveyance illustrated, and picture collections and albums made. It may be possible to introduce field work by visiting a farm, a fishing port, a lumber mill, a cotton plantation, or a mine. Early in our work, the power and signifiance of visual education should be recognized in endeavoring to store up in the mind of each child a series of vivid pictures. As the work progresses, we may add to the details in these pictures. We may carry out certain refinements in retouching the pictures and we may lead them to appreciate the deeper meaning in those mental pictures which they began to develop in childhood.

In the first lessons associated with journey geography, many fundamental elements of mathematical geography may be encountered. The teacher should not endeavor to define the form and shape of the earth, the water bodies, the equator, the tropics, or the poles, but such points in physical and mathematical geography are certain to be mentioned, and they should make some impression upon the youthful mind. The children should learn what they are.

Children soon grow up and become youths, and as we continue training them to study geography, an appreciation of what is going on today in all parts of the world should be taught. They should become acquainted with a knowledge of their own country and their own people and be introduced to the peoples of the other nations of the world. This is an important responsibility for the attitude of the young student toward the people of another land is going to be shaped largely by the teacher's attitude.

At this stage, it is quite important to see in our subject-matter a definite plan of organization. We cannot present the subject as a gazetteer. It is not simply an aggregation of facts. It must not be narrowly nationalistic. We must be impartial searchers for the truth. We must recognize in geography the possibility of a science, that is, the orderly organization of material and the logical treatment of facts.

Formerly, the unit of study was fixed by the political boundaries of states or countries. This absurd basis has handicapped the study of geography for decades. It was a convenience to the publisher and was taken all too complacently by the teachers. As we come to know the geography of the world, we recognize that political boundaries do not determine the occupations of the people so much as the natural environmental factors. Our interest is in human geography and it is useless to try to make the life of Illinois people appear much different from that of the people of Indiana or Iowa. The people of North Dakota or northwestern Minnesota have more in common with the people of southern Manitoba than they have with the people of New England. State, and even national, boundaries become insignificant in many of our studies of human geography. Life conditions do not commonly change at political boundaries. Those boundaries are important in political geography which is important when we are considering the historical background of the present-day conditions.

Geography is a study of the present—a study of a series of remarkable and enthralling dramas which are being enacted in the different natural regions of the world. Here one language is used, there another, but the actions and even the thoughts of the people are quite similar as they are at work where the geographic conditions are similar.

Sometimes a small lowland plain serves well as a natural region where a life has developed which is quite unique and distinctive, and that life is limited by the boundary of that lowland area. Take, for example, the lowland plain of China, or a still smaller lowland area about Tokio. In either of these regions the people use most of the land for intensive agriculture. The land has been divided and subdivided as the population has increased, the fields have been fertilized over and over again and each field has been assigned to that crop which it can produce to greatest advantage. If the land can be flooded, the chances are that rice will be produced; if it cannot be flooded tea, corn, wheat, or millet may be raised. Many of the people have placed their houses on the hillside above the fertile fields so much needed for producing food. The cultural landscape changes at the line where there is a change in topography.

In the mountainous regions an entirely different picture is presented, but one in which adjustment is just as perfect as on the lowland plain. If we visit a land of grass where the rainfall is light and farming is impracticable we are almost certain to meet nomadic tribes wandering about with their herds or flocks. If we go far north into Lapland, we see the people crossing over hills and fens following the reindeer wherever those animals may lead them. These people are without fixed homes, for the animals must wander in search of food and the people must wander with the animals since they depend upon the reindeer for their food and for much of their clothing.

In further training of other people in the study of geography, we find that regions differ because of their topography or the amount of rain received or the length of the growing season or because of contrasts in mineral resources or in water power or harbor facilities. Because of these differences and the alternating of seasons in the northern and southern hemispheres, the regions of the world are complementary. The farming districts provide the food for the manufacturing districts; the tropics provide fruit while the northern and southern zones of intermediate climates provide the cereals or the manufactured goods which are needed in the tropics. One land produces rubber, another sugar, another coffee. Some lands produce cotton, others silk. Some have iron and others copper.

Thousands of illustrations may be found of how the resources of this world are being appropriated by man and how through trade these resources are being interchanged among the various peoples. The importance of favorable economic and political relations, the significance of cooperation, and the futility of isolation should be recognized. No nation can live entirely by itself; no nation is provided with resources so that it is sufficient unto itself. No people can reach its greatest development or enjoy the greatest comfort unless it has intercourse through exchange of commodities and exchange of ideas with the other peoples of the world. There should grow up, therefore, early in the study of geography an intelligent sympathy for other peoples. As geography is developing in this country it is being reestablished in high schools, strengthened in teacher-training colleges, and introduced into many liberal arts colleges and the more progressive universities. During the last five years its development has been exceedingly rapid and today there are indications that many more of the colleges and universities in this land are about to open departments of geography. In these fields of higher education, the work in geography must be matched with the work which has developed for higher education in the natural sciences and in the humanistic studies.

Geography teachers should have direct contacts or relationships with those sciences which furnish a knowledge of the environment. Training in physiography and a knowledge of meteorology and climatology are absolutely essential for one who is going into a thorough study of geography. These two phases are well developed, are organized as sciences, and give a science discipline which should permeate our thinking, whether it be on the physical phases of geography or on its economic and cultural phases. The study requires, furthermore, a knowledge of economics, and the more we have of history and international relations, the better.

Geography should lead to an understanding of the great trends in human affairs. Attention centered on the historic movements or tendencies reveals the spread of population over a territory like that of the United States. Great dramas are enacted as the people migrate westward across the Appalachian Mountains into the valley of the Mississippi or on across the plains to the mountains of the west, or when people settle in the Argentine, on the banks of the Amazon, or on the plateaus of Peru.

The geographical conditions in each region determine the stage setting. Onto each one of the stages, the actors come from the right or from the left and there they look about them for some possible way of making a living. It becomes a problem of economics. What resources are there and what crops can be raised. What industries may be established? With what may we build homes or make clothing? What means of transportation have we? What contacts may we have with other peoples? In all grades of educational work, geographic studies are essential to an understanding of history, economics, or international relations. They are of fundamental importance to those who are guiding the affairs of state.

As the population increases in the various portions of the world, the pressure on the land becomes greater and greater and with each new generation there is a search for more land that can be forced into use. Each new generation pays an additional price for land or it must put a greater effort into that land to produce crops that furnish a living. Perhaps this less desirable land must be irrigated, drained, or fertilized. Perhaps it is farther away from the market. Any one of these qualifying conditions means that higher prices are being paid for returns which are equivalent to those obtained from the better lands.

As men press onward and make a more complete use of the natural resources of the world, competition within the several nations and between the different nations becomes keener and keener. There must be a more perfect adjustment in the utilization of the resources of the world. There must be a more perfect adjustment of human relations to prevent wastes and to prevent those catastrophes which have occurred in the history of the world when nations have come into conflict with each other and caused waste, privation, and long-lasting poverty.

Lessons in geography inevitably lead us to an appreciation of the necessity of each group of people to know the peoples of other countries well. This knowledge is needed in order that they can sympathize intelligently with each other and deal in so friendly a way, that there may be established on this earth peace and good will.

HIGH-SCHOOL PRINCIPALS

C. J. BOWMAN, *Principal, Akron Central High-School,*
Presiding

THE ARTICULATION BETWEEN JUNIOR AND SENIOR HIGH SCHOOLS FROM THE JUNIOR HIGH-SCHOOL STANDPOINT

H. P. SWAIN
Principal, Crestview Junior High School

The earliest junior high-school programs contained little more than a moving backward or downward of senior high-school subjects and methods, but the program today rests upon an entirely different procedure. Unless we accept some of the ideas expressed in the revolutionary changes in the aim and purpose of secondary education and grant them some merit, we shall be at odds in trying to join the old with the new.

The junior high school is not the "resulter" but the resultant. This new unit has had its rapid growth as a result of extensive inquiry into the real function and purpose of secondary education. Regardless of our personal views, the progressive high schools, colleges, and universities stand as witnesses to the radical changes from the old-style academic institutions. A generation ago the most labored function of the high school was preparation for college; the function of college, preparation for some technical profession. Today the chief function of the progressive high school is to aid boys and girls to find their most complete selfhood which will integrate into a society that will be better because of the quality and extent of the opportunities afforded its integral parts.

In the olden days, entrance into high school was literally a matter of the survival of the fittest as determined by the ability to handle formal symbols. Today, especially in the urban centers, the majority of pupils who finish junior high school enter senior high school. In spite of the remarkable increase in high-school enrollment, the following figures present a serious challenge: Of every 1,000 pupils in the first five grades 342 go into high school, 139 graduate from high school, and 72 go to college.

Since we have implied that the solution to some of our present problems would follow the peaceful decease of the old-style academic high school, it behooves someone to speak a word for the "junior high-school idea." I shall, therefore, quote at this point quite freely from Dr. Cox, of New York University:

> The junior high school is a protest against the dehumanized verbal and symbolic grind of formal mathematics, grammar, and history, and against the vicious destruction of human personality that has so often characterized the school procedures both of the conventional grammar grades and of the uninspiring lesson-getting of the freshman year of the four-year high school. The school that was typical in 1900, and that is too much in evidence even today, resulted in the disgust and discouragement of most of the children who were not both bright in regard to abstract verbal intelligence and docile in accepting without question others' thoughts, others' wishes, others' standards as their own. There has until recently been little attention paid to the innovators among our youth, and to the artistic, the mechanical, the socially effective boys and girls. There have been few, indeed, who have had regard for the precious human beings who were being broken on the wheel of our stupid, unreal, and unlifelike, scholastic judgments.

Which seems to say that we who are charged with the training of children of secondary-school age, have an obligation to the individual pupil and to society, and this society is the total of those who "pass" and those who "fail." An obligation not expressed in preparation alone for higher institutions but one that concerns those 918 out of 1,000 down in the lower grades who will never see college—as colleges are now constituted.

We think the junior high school is making some satisfactory attempt to meet this program. We feel equally sure that the progressive senior high schools are likewise meeting the new program. Yet there is still existent among many charged with the daily presentations of the program a "sticking to the old" idea which has in it a desire and expectancy for too much formal technical knowledge.

Just as some present-day college men believe that the scholastic records and subject requirement of Grades X, XI, and XII furnish adequate evidence of fitness to enter college, we likewise believe that the senior high school should carry its own academic load. It is possible, and probably, necessary that the senior high schools continue to be the sifting agency for institutions of higher learning, but it is our contention that its chief concern is for those 342 and not the 72. And this concern may still be a sifting process, preparing those for college who should go, but not sifting out into society the major group marked and stamped with the deadening verdict of failure. The goal of secondary education is "social efficiency not information and mental dexterity alone, the retention of pupils as long as possible, not elimination of the less intellectual and concentration of effort on those who may need it least."

Many of the problems of the junior high school are to be found in its own and assisting groups. Teachers and principals in all honesty of effort to meet the new situation do not always have the clear vision. Our faith in the old is not strong enough to shut out the new, and our concept of the new is not sufficiently clear to guide us in securing the full worth of the program.

Many parents who strive to cooperate find it nearly impossible because their school-day background offers little applicable guiding experience. Some think we have simply made our program easy in order to make it pleasant. Few really grasp completely that our aim is to make our program interesting in order that children may do many worth-while things with pleasure although these tasks may be more difficult than many of the older ones made irksome because there was in them no immediate interest for the child. A further complication comes from the law which requires us to take and keep beyond normal junior high-school age all boys and girls in our community.

Regardless of home, community, or school environment, it is our task to set up a situation which will interest, benefit, and encourage for further school life this heterogeneous group with all its various aptitudes, abilities, capabilities, and inclinations. It is evident that a straight old-fashioned academic course is out of the question. This certainly is no place for ultra-specialization. It should be a place where boys and girls are trained in ideals and attitudes, a place where an atmosphere is developed in which honesty, decision, earnestness of endeavor, fair dealing, and a wholesome spirit of helpfulness abound. A place where each one is successfully doing as a well-knowing member of a little community unlike the larger life only in size and maturity. This does not imply, and would not be, an acceptable program if definite attention were not given to core-subjects.

I have endeavored to establish the proposition that to articulate one unit in our system with a unit above we must agree as to the purpose and aim of each unit. I have tried to show that the junior and senior high-school units, as defined by those who have given much time to the study of the aims and purposes of secondary education, have a definite responsibility to each of their pupils in the avenue of their entry into adult society through junior high school, senior high school, or college. They have an obligation to that society of tomorrow which will become more desirable in proportion to the success we attain in providing a worth-while and applicable program for more and more of those 861 boys and girls deprived of the benefits of a high-school experience.

THE ARTICULATION BETWEEN THE SENIOR AND JUNIOR HIGH SCHOOL FROM THE SENIOR HIGH-SCHOOL STANDPOINT

P. C. BUNN
Principal, High School, Lorain

Since the junior high school is coming to be generally recognized as an integral part of the public-school system, the question of the relationship that should exist between the junior and senior high schools is fundamental. It is one of those interesting problems of school administration that has not yet been solved and one that deserves the most serious consideration. In fact, when we shall have solved the problem of right relations between the parts of the whole school system; when principals, supervisors, and teachers of all grades will have come to appreciate the unity of the school organization, then we shall be able to make real progress in school administration. In this discussion the junior high school will include Grades VII, VIII, and IX; the senior high school, Grades X, XI, and XII.

In Lorain are four junior high schools, and one senior high school which includes the ninth grade of one of the four junior high-school districts. This arrangement is made necessary because the particular junior high-school district in which the senior high school is located has not enough room for the ninth-grade pupils. This is a fortunate arrangement in that it keeps the senior high-school principal in close touch with the junior high-school organization.

Our junior high-school principals are men well qualified by training and experience for their positions. Two of them have had senior high-school experience and all of them have been elementary-school principals. I value their opinions very highly and in the preparation of this paper I enlisted their cooperation by a questionnaire which they kindly filled out. The following questions were submitted to them:

1. What is a practical plan for working out a course of study for the ninth grade?
2. How can the gap between the ninth and tenth grades be minimized?
3. What can be done to help pupils choose their courses wisely?
4. How can we develop a unity-of-organization spirit among teachers of the junior and senior high schools? That is to say, a junior-senior high school *esprit de corps*.
5. Can you give any suggestions for promoting extra-curricular activities that will be of mutual benefit to the junior and senior high schools?
6. What records should be passed on to the senior high school and which ones retained by the junior high school?
7. How can the senior high-school principal be of service to the junior high-school principals?

A summary of the answers of our four junior high-school principals supplemented by my own views on the subject, and an account of some of the things we are doing in Lorain to promote right relationships furnish the material that will be presented in this discussion.

The first question involves not only the question of who shall outline the course, but of how to make a course that will serve the aptitudes, interests, and abilities of our pupils, and at the same time, meet the college-entrance requirements. Probably the ideal plan for making the course is to employ an expert to make a survey of the needs of the community and of the schools; and to advise with the superintendent, the junior and senior high-school principals, and the representative teachers in the actual work of making the curricula. In most communities, however, the employing of an expert is out of the question. In the smaller schools the superintendent, and in the larger schools, the assistant superintendent in charge of junior high schools, should work with a general committee composed of the principals and possibly two junior and two senior high-school teachers in studying the needs of the community and in defining the aims and purposes of the courses to be offered. The outlining of the courses should then be turned over to subcommittees with members of the general committee as chairmen and junior and senior high-school teachers who will work on the particular subjects which they are best qualified to teach. Curriculum committees so constituted have the points of view not only of the administrators, but of representative teachers of both junior and senior high schools.

The committee should continue to function after the courses are in operation, for a course of study should never be considered final but should be a constantly growing piece of work.

The second question in the list deals with bridging the gap between Grades IX and X. This is practically the same problem we had to deal with under the old 8-4 plan in minimizing the gap between the eighth and ninth grades. The fact that the gap has been raised one grade higher is to the credit of the 6-3-3 plan of organization although the compulsory-attendance law must be given credit or blame, if you so wish to look upon it, for helping to raise the gap one grade.

There are several ways in which this situation may be improved. The parents as well as the pupils in all grades should be taught to see the unity of the whole school system; and to realize that there is no sharper dividing line between Grades IX and X than between Grades IV and V.

More courses should continue from Grades VIII and IX into Grade X. This can be done by the introduction of prevocational courses as well as by a better articulation of academic subjects. The teachers of Grade IX should have a better understanding of the work expected of their pupils when they enter Grade X and the tenth-grade teacher should know what work has been done in Grade IX. Conferences between teachers of these two grades will be mutually helpful in bridging the gap between courses. A more uniform terminology in textbooks would aid both teachers and pupils. Extra-curricular activities, the school papers, and the assembly periods of the two high schools can be used to advantage in bridging the gap between the junior and senior high schools.

The assistance given to the pupils in choosing their courses is one of the problems that has not been attacked successfully in most schools. Since our school does not have an expert in vocational or educational guidance to direct this work, I shall leave the expert out of the discussion. We publish a handbook that is given to every eighth-grade pupil about six weeks before the close of the semester. This handbook contains an outline of the courses offered and suggestions for helping the pupil to choose his course. The junior high-school principal or the homeroom teachers go over this handbook with the pupils who are urged to take them home so that they may consider the courses with their parents.

About four weeks of the ninth-grade course in community civics is spent in a survey of vocations. Each pupil is required to choose a career which he thinks he would like to follow. He is then required to find as much material as he can about the chosen career both from the library which contains a great deal of supplementary material on vocations, and from personal interviews with men or women engaged in that vocation. After he has collected his material, he writes a "Career Book" in which he discusses his life work.

A meeting of the junior high-school parent-teacher associations devoted to a discussion of the courses offered in the high school led by the high-school principal is always welcomed by parents. Many of them are absolutely ignorant about advising their children and they are glad to be informed. None of the above methods will be effective in reaching all pupils and their parents. Consequently, the school will have to assume the responsibility for guiding many pupils in the choice of courses. Individual conferences with the homeroom teachers or the principal or with teachers especially qualified for this work will provide guidance for these pupils.

The fourth question in the list, that of creating an *esprit de corps* between the teachers of the two schools, was asked because there seems to be a feeling on the part of some of the teachers of the junior school that the teachers of the high school have a tendency to belittle their work. The junior high-school principals do not look upon this as a serious problem, and they recommend occasional meetings for the two groups for the discussion of topics of general interest. Doubtless, such professional meetings would develop a sympathetic and helpful attitude among the teachers. One principal suggested that equal pay for equal training and experience was the easiest solution of the problem.

"Can you give any suggestions for promoting extra-curricular activitives that will be of mutual benefit to the junior and senior high schools" was the fifth question submitted. All our principals believe firmly in the value of extra-curricular activities and in each school there are several improvement clubs in addition to the musical organizations, the debating clubs, and the various athletic teams. Answers to this question show that they indorse the program we have in operation, a program, I think, that makes for a splendid spirit of cooperation.

There is general agreement among the principals that the following records should be made in duplicate, one copy for the senior high school and one to be retained by the school from which the pupil is promoted:

1. A 5½ by 8-inch permanent record card—
   One side of this card should contain the usual data: the pupil's name, date of birth, name of parent or guardian, residence, subjects completed with marks indicated, name of school and date of promotion. On the other side there should be data concerning his ability in terms of intelligence quotients and efficiency quotients; his attitude toward school; his aptitudes and special interests as shown in his participation in extra-curricular activities.
2. A so-called "sponsor record"—
   The items on this card are based on the information secured through home visits.

The following are some of the ways in which the senior high-school principal may serve the junior high schools:

1. By holding regular conferences with the junior high-school principals for the purpose of discussing problems of common interest
2. By sending to the junior high schools a report of the marks made by their former pupils. The principals and teachers are interested in these reports
3. By pointing out the shortcomings of the program of the junior high as shown in the work of pupils after they have entered the senior high school
4. By developing a sympathetic attitude among his teachers toward the junior high teachers so that there will not be a tendency to discredit the work of the teachers of the lower grades.
5. By acting in an advisory capacity in the work of directing pupils in the proper selection of courses
6. By visiting occasionally the junior high schools for the purpose of observation
7. By addressing at least once each year the junior high-school assemblies
8. By leading a conference of junior and senior high-school teachers on matters that are closely related to the work of the two schools

Inasmuch as this paper has summarized the answers to the questionnaire submitted to our principals, and a brief review of some of the activities of our own schools, it is not necessary to close the discussion with any further summarization.

THE RELATIONSHIP THAT SHOULD EXIST BETWEEN THE ADMINISTRATIVE FORCES OF A SCHOOL SYSTEM AND THE HIGH-SCHOOL PRINCIPAL

E. D. LYON
Principal, Withrow High School, Cincinnati

The modern high school is a popular institution. The law of the state requiring day-school attendance until the age of sixteen, the attractiveness of the buildings, the varied activities, the good and cheap lunches hold to the school many who have little appreciation of the opportunities offered them. In the large city high schools, adjustments to meet the difficult situations, growing out of the attendance of many who cannot or who will not master the subjects of the standard curricula form our most serious problems. They call for wise counsel and much deliberation. The superintendent and his assistants must consider them with the help of the high-school principals and the teachers.

Just how are we to develop a relationship that shall be most informing to the superintendent and most stimulating to the principals. In one city, it is the custom to hold a monthly meeting, beginning at eleven o'clock. There is lunch at twelve and the meeting continues until late afternoon. The superintendent of schools, the assistant superintendents, and the high-school principals are present. Topics for discussion have been solicited and are before those present along with the minutes of the preceding meeting. Discussion of vital matters is free and perfectly frank. This, of course, keeps the superintendent informed concerning what the principals deem important.

Reference has been made to the present urgent problems in the large city high school. Would that there were time to enlarge on the value of conference and discussion provided there is a degree of open-mindedness and in each one a certain equanimity of spirit, even though cherished opinions are attached and possibly slaughtered. It is all in the spirit of the discussion. Many knotty problems have been solved by full and candid discussion, and we plead for a close association of the principal and his superintendent and for a free, kindly, and frank discussion of the important school issues.

Another important factor is the manner in which orders from the chief office go to the subordinates. We believe that all requests or orders relating to the high schools should go through the principal. It is easy to be critical. Friendly, constructive criticism should be welcome, but destructive criticism accomplishes nothing. We are all working to the same ends, namely, to make good citizens of the youth entrusted to our care, to place about them conditions favorable to the mental and spiritual growth, to stimulate to worthy effort, to try to help each one to find the life work in which he will be most useful to himself and others. To reach these ends we need encouragement where it is deserved, frank, friendly criticism when it will help, the benefit of frequent counsel, the privilege of a free interchange of opinions. Under such conditions our relations will be cordial, helpful, and mutually stimulating.

THE RELATIONSHIP THAT SHOULD EXIST BETWEEN THE GENERAL ADMINISTRATIVE FORCES OF A SCHOOL SYSTEM AND THE HIGH-SCHOOL PRINCIPAL

R. G. Jones
Superintendent of Schools, Cleveland

The requirements for an ideal principal are being set pretty high. The head of Horrow School for Boys, of 600 enrollment, in England, is paid $75,000 a year. I am sure we have many men in this country who are worth that or more. I expect to live to see many striking figures in high-school principalships receiving ten to twenty thousand dollars per year. Possibly the latter figure will not prevail in the large cities, but wealthy suburbs will pay almost any salary now to a man who is a combination of culture, scholarship, athletics, and diplomacy. You may be surprised to know that what one may term all-around high-school principals or superintendents, are almost impossible to find.

If the high-school office has failed to meet the standards expected of it perhaps the board of education, the superintendent of schools, and the principal are jointly responsible. High-school positions have always looked to me to be quite smothered in petty details—personal adjustments between teachers, parents, and students. This all must be done, perhaps first, but there must be time for the principal to think. To do this he needs to be flanked by competent assistants who have knowing eyes, clean-cut decisions, and courage.

Classes in educational administration have stressed the mechanics, or perhaps we ought to call it the science, of administration so much that the main job gets scant attention. Organization and mechanism are chiefly matters of research. We have been quite concerned with operation, checking, and indexing but they are secondary. Such work in the larger system is placed in the hands of competent clerks or experts, and the high-school principal should have only a reading knowledge of this phase of the work.

We may pass judgment upon a high-school principal by considering:

1. The neatness and cleanliness of the building
2. The care with which records are kept
3. The organization and extent of the curriculum
4. The classification of students on a mental test basis
5. The extent of laboratory and library equipment
6. Athletic records
7. The extent of subsidiary organizations and activities
8. The character of class instruction
9. The type of the individuals who are giving the instruction
10. The type of principal
11. The product of the school
12. The reaction of the community

The principal must possess the necessary ability to discover personnel to supplement his own powers. A one-man organization is the best, if the one man is surrounded by a capable staff. Judgments may be passed upon the foregoing items in various ways. While we are impressed by neatness and precision and completeness, all this might be done to no definite end. In the railroad yards of Dayton my attention was challenged by an engine polished and shining. Its marking was D. T. and I. It was Henry Ford's engine. Henry Ford did not polish the engine, but he polished the men who polished the engine. If men and women of right qualifications are at the head of a cause or an institution, the mechanics of office procedure, and curricula will follow.

The comment upon the value of education is patent to us all. Do we really believe that being careless with the teaching process is as dangerous as infantile paralysis or do we believe that no scars result from miseducation? Do we exercise the same care in the presentation that a surgeon would exercise in cutting into a patient? It is very doubtful. If miseducation does leave scars, mass education is dangerous. If our faith in education is to be conserved, we must carry it on with the same care that we would protect human life. This seems like a superserious view to take, but if we believe what we proclaim or if we believe what the public believes, and pays for, education calls for the best in the best people.

When one selects a good teacher, the teacher develops, wins promotion, and passes on unless new and attractive plans are devised to satisfy the craving for development. The selection of a dull teacher has great chances for permanency. A dull mind is content with no growth and the stream of education soon clogs with moss. The responsibility of headquarters is to set a salary schedule high enough to buy talent, to see that the principal is competent to discover talent, is not afraid to employ talent, and knows how to employ it to the mutual profit of the teacher and the school, so that it will remain to attract other talent.

Experimentation is the life of any school. No one who is thinking and reading can for long, carry bottled up suggestions without an outlet. This applies to the principal and teachers as well. Training in the summer schools is an agency for rehabilitation and progress, but the spirit of inspiration is in the principal's office during the school year.

The relation of school headquarters in this case should be keeping the principal alert by meetings, suggested library reading, lectures, and all possible means of educative improvement. The process prescribed provides for the elimination of waste and substitution of new and richer material or in the continual clarifying of the old, in contrast to a checking process to determine how much of the prescribed program has been carried out. No pains should be spared to supply new and good material in abundance.

The principal should be the master of his school. It will bear his imprint, weak or strong. Washington Irving High School, in New York, is surely the lengthened shadow of

William McAndrew—and a fine shadow it is—good enough to represent a life's work. What does the superintendent's office owe in protection? It owes the principal freedom to carry out his ideas. It requires courage to grant promising men and women initiative and a chance for growth, freedom to act up to the point that individualism mars organization and interferes with the system in general.

The mark of efficiency in a school is that which gives a school its standing. A principal by virtue of personal charm or striking demonstrations may, for a time, present a pleasing educational picture, but schools like Shortridge, Indianapolis; Oak Park High School; and Washington Irving School, New York, are respected for persistent results. These came about through competent principals who picked competent staffs.

What does the headquarters office owe in this case? It owes all the factors of encouragement, salaries, publicity, and physical and spiritual equipment that express appreciation of service. No great school is born of transient principals and transient staffs, because no deep attachments are made in brief spaces of time and service.

We are all familiar with the names and much of the biographies of great men. Some of these seem to have been masters of technique, but all have been masters of men. We think of Christ in religion, Peter the Great in governmental organization, Ford in industry, Rockefeller in commerce, and Lincoln in human welfare. It would be difficult to assign common qualities to these individuals. Headquarters might well submit a selected course in the biographies of great leaders to principals. Leaders, no doubt, fall heir to opportunities which our headquarters might well leave lying around convenient for appropriation. A substantial financial subsidy for promising and competent persons may be one of such opportunities. Another opportunity which I hope may be available is a freedom to think and act that principals may be unfettered by expediency and from politics. If gifted, then let them think through from traditional education to an education differentiated and adapted to all.

HISTORY

CARL WITTKE, *Ohio State University*, Presiding

THE PROPOSED INQUIRY INTO THE SOCIAL STUDIES IN THE SCHOOLS

EDWIN W. PAHLOW
Ohio State University

Recognizing the chaotic state of affairs that exists in the social studies in the schools,[1] the American Historical Association has appointed a committee to devise a plan for a thorough investigation of the situation. This committee differs from previous committees of the association in its inclusion of representatives of the social studies other than history. Besides including all the social studies taught in the schools, the committee's scope differs from that of earlier ones in extending from the pre-primary grades through the junior colleges.[2] It is estimated that the investigation will cost $375,000, and that it will take at least five years to complete it.

The results of the investigation will be eagerly awaited by social-science teachers everywhere, but, in the meantime, there is much they can glean from existing reports that will be helpful to them. The first report of the association by its Committee of Seven (known to too many teachers only as the sources of the four "blocks" in history) contains three statements that have a modern sound.

> The chief object of every experienced teacher is to get pupils to think properly after the method adopted in his particular line of work. . . . The library should be the center and soul of all study in history and literature; no vital work can be carried on without books to which pupils may have ready and constant access . . . If history is to take, and hold its proper place in the school curriculum, it must be in the hands of teachers who are thoroughly equipped for the task of bringing out its educational value.

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[1] Dawson, Edgar. "The History Inquiry: Report of the Director," *Historical Outlook*, 15:239-72, June, 1924.

[2] "History and Other Social Studies in the Schools," *Historical Outlook*, 18:110-22, March, 1927.

If social-science teachers, and school administrators as well, will take these three utterances to heart and for the next five years make them their guiding principles, the new report will appear when there exists a healthier state of affairs than at present and when there is greater likelihood of its recommendations being speedily translated into action.

MASTERY TECHNIQUE IN THE SOCIAL STUDIES

Howard C. Hill
Assistant Professor of the Teaching of the Social Studies, University of Chicago

During the last seven years, the Laboratory Schools of the University of Chicago have been engaged in an educational experiment concerning which I am to speak this morning. To guard against misunderstanding let me say at the outset that I appear as an expositor, not as an advocate; as an exponent, rather than as a partisan of the procedure to be described. It is not a panacea for all educational ills. Moreover, as the public schools are now situated, it is doubtful whether this mode of instruction in its entirety is applicable to the general run of schools. It does, however, contain features that I think will commend themselves to you.

In its outward aspects "Mastery Technique" departs in a number of particulars from the prevailing mode of instruction—the plan of assigning a lesson one day, prepared outside of class, in study hall, or at home, to be recited upon in the classroom the following day. We do not have daily assignments, daily recitations or required home work. The material is not organized into daily lesson units and there are no percentile grades. In these particulars the procedure differs from the mode of instruction which exists in most of our schools.

Mastery Technique has its origin in the work of Professor H. C. Morrison. The educational philosophy which lies back of it, and of which I shall speak briefly, is drawn from personal contact with Professor Morrison and from his recent book. The heart of the matter may be made apparent by considering such questions as these: Under ordinary practice what do the boys and girls take away with them at the end of the classroom period that they did not bring? How are they changed as the result of the forty-five minutes they have spent with the teacher? Are they any different from what they were when they entered? If not, then, according to the philosophy of the Mastery-Technique procedure, no education has taken place and the time has been wasted. Do they carry away with them a new outlook, new aspirations, new inspirations, improved habits of work? If so, education has occurred.

Education may, therefore, be defined as a change within. If no change has occurred, there has been no education. The important point is not, What have you taught boys and girls? but, How have you changed boys and girls? May I illustrate by the familiar example of the moth and the candle? The moth approaches the lighted candle, burns its wings, and flies away. After a moment it returns and again burns its wings. This experience is repeated time after time until at last the moth is killed. The moth cannot be educated because it cannot learn from experience. Education comes as the result of experience, but experience itself does not educate. The moth had the experience, but received no education. There was no change within. A little child, on the other hand, is attracted by the lighted candle, sticks its finger into the flame, is burned, and withdraws. So far the child's reaction is the same as the moth's. The child is again attracted and again reaches out its hand but, unlike the moth, does not again put its finger into the flame. Why not? It has been changed by the experience. Education has taken place. In like fashion, if boys and girls come into the classroom at ten o'clock and leave forty-five minutes later the same as when they entered, no education has occurred for there has been no inward change.

The prevailing mode of instruction is regarded as defective because it is not well adapted to meet the prime function of the school. Too often it does not provide experiences that are educative in character. It does not create an environment which is best suited to bring about inner changes.

Six of the outstanding defects in the prevailing mode of instruction call for consideration. The first is the use of the question. As ordinarily used it is a wasteful device. If a pupil knows the answer, why ask him the question? If he does not know the answer, why ask him the question? In either case, why ask the question?

The second defect in the prevailing mode of instruction is that it leads to inattention on the part of the pupils. Before one can learn from experience he must be attentive to that experience. Any method which does not hold the attention is wasteful to that extent.

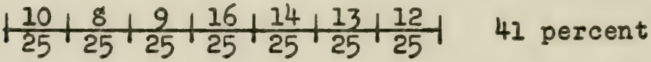

Figure 1.

Figure 1 represents Class A of twenty-five pupils in which the mode of instruction used was the ordinary question-and-answer recitation. The intervals indicated by the short perpendicular lines represent the passage of two minutes. At first ten pupils were giving attention, then eight, nine, sixteen, and so on, at intervals of two minutes as shown by the diagram. The result reduced to percent shows that the percentage of attention for Class A was 41.

This is a wasteful process. No business man could afford to continue operations long with such loss. Of course, there is a chance for error by the method of calculation; but even when one allows as much as he pleases, he has a fairly accurate analysis of what is actually being done. If one wishes to be meticulous, the figures indicate a better situation than is the fact. If the instructor proposes, for example, to develop a certain sequence of thought, the percentage of attention will be much less than 41. Take a given pupil and draw a rough plan of his attention. Under the example given above, what will you find? Constant breaks. Now he is attending and now he is not attending. Maybe he can't hear. Perhaps he doesn't understand. Possibly he is indifferent. If you make a graph of the attention of a given pupil under the conditions described above, you will find constantly a broken line, like this:

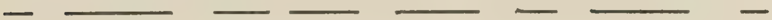

Figure 2.

The smallest number of pupils giving attention at any one time, as shown by Figure 1, was eight pupils. Where were the thoughts of the remaining seventeen? Certainly not on the matter of instruction. Is it not obvious that a great loss occurs in educational effort, if we regard attention as a prerequisite to the learning process?

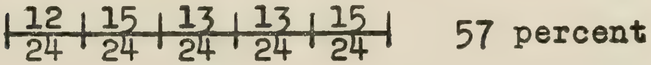

Figure 3.

In the same school system another class was visited. The teacher apologized, because nothing was happening, since the day was the one time during the month which was set aside for supervised study. The results of an analysis on attention made in the same manner as in the first class appears in Figure 3. Again there is a high loss due to lack of attention, but the percentage is 16 percent better than in Class A. Since, however, this class, Class B, had the experience of supervised study but one day out of twenty, it was hardly frequent enough to establish habits of work. Nevertheless, even under such circumstances we notice a change for the better. To the business man, it is worthy of note, a margin of 12 percent represents the difference between success and failure.

In the third class visited, represented by Figure 4, the plan throughout the year had been to use the work type of instruction rather than the ordinary question-and-answer method. The school was located in a city in the steel district of Pennsylvania, where a large percentage of the pupils were foreign. The class was in the junior high school, and hence was composed of younger pupils than in the instances represented by Figures 1 and 3, which were high-school classes. Notwithstanding the differences in age and grade, however, the percentage of attention, it will be seen, was 83. The prevailing mode of instruction does not seem to be well adapted to providing educative experience, then, first, because of the wastefulness of the question and, second, because of the tendency toward inattention.

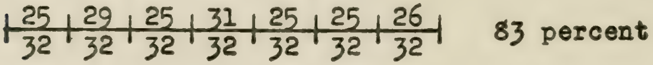

Figure 4.

The third defect is that the question-and-answer type of instruction fails to provide for individual needs. No two pupils in any class are just alike. Is allowance made for pupil differences in the prevailing mode of instruction? Does a teacher ordinarily consider before the recitation begins, "Is the question that I am going to ask today well suited to the needs of James? Is it suited to the needs of Tom?" Or are the questions asked with no thought of their fitness for the pupils concerned? What may be food for James may be poison for Tom. Whenever the mode of instruction is for an entire group of differing pupils the activity that fits the needs of one may miss the needs of the others. If our experiences are to be truly educative, we must provide for individual differences.

The fourth defect in the daily-assignment method is that it leads to the formation of bad habits of work. There are those who think the most important products of the schools are the habits and attitudes which boys and girls take away. If this is the case, should we not focus our attention upon the formation of desirable habits and attitudes? When work is prepared outside the classroom, however, habits are formed beyond the control of the teacher. By such procedure we are doing the same as a teacher of golf who might tell his pupil how to play the game and how to hold the various clubs, and then would say, "Now go out on the course and play." That is not the method of a good golf instructor. He goes out on the course with his pupil; he shows by example how to stand, how to swing, how to use each club to the best advantage. Would not the same plan be helpful in the study of history? Unfortunately, the assignment is usually given to be studied outside, the pupil forming his own habits of work, with little guidance or direction.

The fifth defect is a failure to develop in boys and girls genuine intellectual tastes. They are too often like the lad who muttered as he received his high-school diploma, "Thank heaven, I'm through with English literature." It would seem, that at least part of our failure in this respect is due to the inefficiency of the method of teaching employed.

The sixth defect is the use of the same method of instruction for different subjects, regardless of the fact that the learning products or the objectives may be different. The same procedure, for example, is usually employed in a literature class as in a history class. If the learning product in the two is the same, then the same mode would seem advisable; if not, it would seem unwise. In the teaching of a modern language the objective is the mastery of a mode of communication. Does the teaching of history have the same objective? If so, the same procedure is applicable. The philosophy of the experiment under discussion would require different modes of instruction for different objectives.

Professor Morrison divides teaching into five general types as follows: (1) the language-arts type, involving the mastery of a language; (2) the manual-arts type, involving the mastery of motor skills; (3) the pure practice type, in which the objective is to acquire a certain kind of skill, such as, stenography or penmanship; (4) the appreciation type, for the development of a liking of the fine arts; and (5) the science type, in which the learning product is the understanding of principles, concepts, or significant aspects of a subject. It is with the last type that we are concerned here.

The science type of teaching includes instruction in the social, mathematical, physical, and biological sciences, as well as in all courses in which the objective is understanding or rationalization. If the objective is appreciation, the science type of instruction would not be followed.

The chief criticism directed against the prevailing mode of instruction is half-learning—the practice of passing boys and girls if they make a certain mark. Professor Morrison holds that this practice is probably the chief factor in the inculcation of the "get-by" attitude. He maintains that in the strict sense of the term there is no such thing as half-learning. Either the desired change or adaptation has occurred or it has not occurred. Take, for example, a child who is learning to write. At the point where thought and attention are no longer necessary to make the symbols the change has occurred. The same is true of learning to read. The transformation point, or the mastery level, is the point or level where thought need not be given to the mechanical aspects of reading or writing.

The criticism of half-learning brings us to the heart of the Mastery-Technique procedure. This is summarized in the following formula: Teach the principle involved; test to find out if you have succeeded; diagnose the situation in cases where you have failed; modify the instruction to meet the need; teach again; test again; and repeat the process until mastery is attained.

You will always find, judging from our experience, that there are some pupils you have failed to reach by the first teaching of the unit. The test will reveal the failures. The thing to do then is to diagnose the situation. The diagnosis may be correct or incorrect, but you are like a physician, who diagnoses a case and applies the treatment which he believes will help the patient. Perhaps at first he is wrong. In that case he tries something else. It is the same in teaching. You diagnose the situation, modify the instruction accordingly, and test again. The procedure is repeated until the purpose is accomplished and the desired change or modification has occurred in the pupil. Occasionally one finds a pupil who is subnormal; then the treatment must be pathological, but, fortunately, there are not nearly as many subnormal children as we are apt to think.

With our philosophy and analysis clear, let us now turn to teaching as conducted in accordance with the Mastery Technique. A complete examination would necessitate, first, a consideration of the factors involved in the selection and organization of subject-matter, and, second, an explanation of classroom activities. The selection and organization aspects of the matter are omitted owing to lack of time; the discussion is limited, therefore, to classroom procedure. With material organized into what we call units, let us examine the procedure followed.

Suppose that I am the teacher and you are the class. Assume also that yesterday we completed a unit and that today we are starting a new unit. Our first step then would be exploration or preparation. In exploration we begin as a rule with a written test upon the new unit to be studied. The remaining classroom time for the day is devoted to an oral test which is exploratory in character. Different members of the class are questioned to find out what understanding and information they have on the new unit. Speaking psychologically, the teacher endeavors to discover the apperceptive basis for instruction. Exploration is intended first of all, then, to inform the teacher, to acquaint him with the foundation upon which he must build. There is, however, a secondary motive. If the teacher is skillful in the questions which he asks, he will arouse curiosity concerning the unit to be studied. The teacher does not answer the questions, but attempts to arouse in the pupils a desire to find out the answers. The secondary motive, then, is to establish a purpose for the work.

Presentation, which occurs on the next day, is the second step. It consists of the teacher's giving, in an interesting talk of fifteen or twenty minutes, a bird's-eye view of the new unit. The teacher works in much the same way as an artist, by sketching, in broad lines, the outstanding aspects of the new unit. The object is to orient the pupils in the line of work which is about to begin. This is wholly a teaching operation. Exploration, on the other hand, is not a teaching operation.

According to our formula we must now test. Hence the remaining time in the period is given to a written test, usually taking the form of an essay in which the pupil explains or interprets what he has just heard. The papers must be looked over before the class meets on the following day, for the results determine the next day's procedure. It is not an uncommon experience to find that out of a class of thirty, ten papers are acceptable and twenty are not. In such cases we give the presentation again. The ten who had acceptable papers will be helped, we think, rather than hindered, by the second hearing. The presentation, of course, will not be the same, for obscure parts will be developed, new illustrations given, and emphasis altered. The second presentation, which ordinarily takes about fifteen minutes, is followed by a second test. This process is continued until it is evident that every pupil in the class has learned that which was the purpose of the presentation. When this is accomplished, all of the pupils will be ready for the third step. Some of them who have been ready earlier will have begun work upon it.

The third step is called assimilation. Here the process changes radically; the pupil, hitherto passive, becomes active. Each member of the class is given guidance sheets (not outlines), containing the minimum essentials of the unit. The teacher next makes suggestions about methods of beginning study. The pupils then go to work. On the walls are maps, charts, posters, graphs, and the like. In the room are bookcases, holding two or three hundred volumes. The children select the books they wish to use and begin work. Study continues for about two or three weeks, varied from time to time by reports, by class discussion, and by conferences with individual pupils. Occasionally there will be tests to discover whether the objective is being reached. When evidence indicates that the class has mastered the unit, they are ready for step four.

The fourth step is organization. The pupils put away their books and notebooks and prepare an analytical outline of the entire unit. This ordinarily requires about fifty minutes. During this time the teacher gives no help. The work is individual on the part of all pupils. The purpose is to give experience in arranging subject-matter in an orderly way to show relationships, connections, and the development of thought. The object is not to reproduce the guidance sheets which, in fact, do not constitute an organization of the unit. The objective, in short, is teaching, not testing. If the papers are not satisfactory, the result indicates that the teacher has misjudged the situation and that the pupils have been permitted to organize before they were ready.

The last step is recitation. In this step the pupils usually come before the class and give an account of the unit as a whole, or of some given aspect of the unit, which the teacher may announce or the pupil may select. Sometimes the recitation is written. Here, as elsewhere, variations frequently occur.

Ordinarily the whole process in the mastery of a unit takes about twenty-one days. A typical distribution of time will be exploration one day, presentation two days, assimilation fourteen or fifteen days, organization one day, and recitation three days.

So much for the outward aspects of Mastery-Technique instruction. Many questions of detail cannot be discussed owing to limitations in time. As far as the defects of the daily-assignment mode of instruction are concerned, these seem to be practically eliminated. Pupil attention to the work at hand is generally from 90 to 100 percent. So far as assimilation is concerned, there is necessarily more or less waste; it is difficult to keep each pupil at work all the time. Here the personality of the teacher plays a large part, for it is the greatest single element in successful instruction. Variations occur in different classes, but in so far as the inculcation of general intellectual tastes is concerned, the procedure offers unusual opportunities. Some pupils may complete a unit in twelve days, leaving for independent investigation the time used by the class as a whole. In the hypothetical situation given, the pupils who need only twelve days for the required work will have nine days to pursue intellectual tates. When the formula is applied, there is no half-learning.

In conclusion, let me say that the type of activity within the school which most closely approximates the type of experience which leads to successful work outside the school is the type which is most desirable from the standpoint of education. When you are asked to write a term paper or a thesis what immediately takes place in your mind? Do you not ask yourself, "What do I know about the theme named?" If so, you subject yourself to exploration. In the next place do you not try to get a bird's-eye view of the theme, perhaps by going to a one-volume history or a reference work? If so, you are giving yourself a presentation. In the third place, do you not begin to collect material? If so, you engage in assimilation. Then do you not make an outline? This is organization. Finally, do you not write out your study? This corresponds to recitation.

The same process is common in the work-a-day world. Take, for example, an architect. First, he asks about the purpose of the building for which he is to make plans, the cost contemplated, the material desired. That is, he explores. Second, he submits a rough sketch to the person who wants the building; he presents. Then he begins to computate the necessary data, the cost of material, the labor, the building strains, and the like; he assimilates. Next he submits a final plan for the structure; he organizes. Finally, he supervises the actual construction of the building; such action corresponds roughly to recitation. Thus, in its larger aspects Mastery Technique seems to approximate the habits of successful work in the world of affairs.

NOTE—The treatment of Mastery Technique, as pointed out above, is confined to the larger aspects of classroom procedure. The elements involved in the selection and organization of subject-matter, which are commented on by Miss Bucks and Mr. Kohl, were necessarily omitted due to limitations in time. Persons who are interested in the phases of the matter raised by them are referred to H. C. Morrison's *Practice of Teaching in the Secondary School,*[1] and to my *Course in Modern History.*[2]

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[1] Morrison, H. C. *The Practice of Teaching in the Secondary School.* Chicago, University of Chicago Press. 1926. pp. 153-98.

[2] Hill, Howard C. *A Course in Modern History.* Chicago, University of Chicago Press, 1923. pp. 103-15. (Supplementary Educational Monographs, No. 24)

HOME ECONOMICS

ALICE M. DONNELLY, *Ohio State University*, Presiding

BRINGING THE HOME ECONOMICS CURRICULUM UP TO DATE

JANE HINKLEY
University of Nebraska

Whenever we challenge what is being taught in a certain field of instruction to determine whether it is desirable or undesirable, and what changes should be made, we are faced with the questions: What is the end or aim toward which we are striving? What do we expect these courses to accomplish? What do we want our final product to be? We used to express objectives in terms of subject-matter to be learned, but we now see them in terms of the pupil we are instructing. We can express our present objectives in home economics then by stating the characteristics, abilities, and skills that the girl should possess after she has been trained. Dewey tells us that if objectives are worth while they must be the outgrowth of existing conditions, and must be founded upon the intrinsic activities and needs of those who are to be educated. Our objectives in home economics, therefore, must be drawn from a consideration of the needs of our high-school girls and the activities that they are and will be called upon to perform.

Statistics tell us that between 80 and 90 percent of our girls will become homemakers, and our experience tells us that practically all of the remainder will be connected with homes in one way or another. Therefore, our basic objective in home-economics training must be the development of girls who will be efficient in solving the home problems of their day. Dean Russell of Teachers College, Columbia University, expresses his feeling toward the need of training for homemaking in his discussion of vital things in education when he says that the school can help to atone for the sins committed by ignorant but well-meaning parents by instructing the boys and girls, "who will some day have children of their own, how to save their children from those faults from which they themselves have suffered." He thinks Herbert Spencer must have felt the same need years ago when he asked the question:

> Is it not an astonishing fact that though on the treatment of our offsprings depend their life and death, their moral welfare or their ruin, yet not one word of instruction is ever given to those who will hereafter become parents?[1]

If then our objective is to lead girls to develop efficiency in handling home problems, our courses must provide for such training and will be successful only to the extent that we give them experience with problems similar to those they will face.

What is the nature of the problems of the homemaker of the present? Is her chief need the development of skills involved in feeding and clothing her family? This was the chief need in Colonial times, and the girl received just the training that she needed through participating in home activities. Her duty as a member of the family, helping in the production and preparation of foods and clothing for that family, gave opportunity for the development she needed to become an efficient homemaker in her day. However, the equipment that made a girl efficient as a homemaker in Colonial times, or even a few years ago, will not meet her need at present. Great changes have taken place in our ways of living, habits, attitudes, even in our civilization itself, and the home has been greatly affected by these changes. Old problems have changed and new problems that are complex and baffling have developed. The home can no longer give the girls the homemaking training needed because it does not give her the experience and knowledge that she needs, so we are challenged in the field of home economics to provide what the home is not able to give. If we are to do this successfully we must keep our training abreast of the need, and since needs are constantly changing, our curriculum must change accordingly. We are reminded of one of Alice's experiences in her *Adventures in Wonderland.* The Red Queen had been rushing her along so very fast that she was tired and out of breath. At last she turned to the Queen and asked, "Why is it that we are rushing on so fast and yet we aren't getting anywhere?" "O," replied the Queen, "we shall have to go much faster than this to get anywhere. We have to go this fast to keep up." We could well have as our motto:

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[1] Russell, James Earl. *The Trend in American Education.* Boston, American Book Company. 1922. p. 172.

> New occasions teach new duties
> Time makes ancient good uncouth,
> We must upward then and onward,
> Who would keep abreast of truth.

We have said that present home problems are different from those of the past. Let us see in general how they differ. Production of foods and clothing has been taken from the home, and preparation and construction are decreasing. Therefore, giving training to develop skills in these processes is not our outstanding need at present. We need girls who are not just skillful cooks and seamstresses; our need is for girls who can see and solve new and changing problems, girls who have a knowledge of principles to guide them rather than tradition and superstition, who can think clearly and independently, who have developed initiative and resourcefulness. To provide a curriculum that will lead to this type of development requires much more care than would the development of skill only. If we wish our girls to develop a body of skills with only enough information to use them, we need only to provide for much practice in cooking and sewing. If, however, we are to train the girl to see problems of the home and be efficient in working them out, we must provide experience that will give opportunity to see and solve problems as nearly as possible like the ones she will have later.

If we are to adjust our curriculum so that we can do this, we must know what the present problems of the home are and what development the girl needs to be able to handle them successfully, for this will show us what we shall teach.

Three methods have been advised for getting this needed information. The first method is to make an analysis of the present activities carried on by the homemaker. Dr. Bonser of Teachers College, Columbia University, made such an analysis as a basis for the development of the home-economics teacher-training curriculum. These activities would indicate what abilities the girl must develop to be a successful homemaker. The second method is to analyze the traits of the successful homemaker. Dr. Charters has recently published such a study. The use of this study in building a curriculum would be to determine what traits the homemaker should possess, and then put in the curriculum the subjects that make for the development of these traits. The third method is suggested by Harap in his book on *The Education of the Consumer*. His plan is to study present existing conditions and determine where the economic consumer falls short, and what are the homemaker's greatest weaknesses from the standpoint of the economist. This would indicate what needs to be emphasized most in the curriculum. It would seem that the best curriculum would make use of all three of these methods.

Let us look squarely, then, at the present situation and see what activities make up the work of the homemaker, with what knowledge, habits, and attitudes she needs to be equipped, and in what ways she is falling short. In suggesting what shall be taught, it is impossible to give attention to the various phases of the work in detail. It seems best to bring out the new phases and the most evident needs of the old. We shall consider briefly the present outstanding problems in connection with foods, clothing, and housing, also what we consider now to be the most vital features of child development and social and family relationships; and, in connection with these problems, the evident need for stressing more efficient use of time and effort.

The homemaker is still responsible for the feeding of her family, but she has more complex problems in connection with this duty than formerly. Harap, who has made a quantitative study of food consumption, gives us the following significant facts: The consumption of food by the great mass of the people is largely governed by custom, not by knowledge; too much meat is eaten; we eat two and one-half times as much fat as we need, and twice as much sugar as the French and the English. We do not consume enough milk and dairy products, fruits or vegetables; too much money is spent for tea and coffee; ten percent of all edible food purchased is wasted; the under-consumption of certain desirable foods is due in part at least to lack of knowledge of how to prepare them attractively; a large part of our population is falling below the energy requirement. What then do we need to teach in our foods courses? The above facts show that we need to emphasize the amount and kind of food that the body needs. Especial attention should be paid to the development of better food habits and standards. In the preparation of foods we need especially to study vegetables and fruits so that girls may find them palatable and attractive.

The homemaker still has the chief responsibility of clothing her family. Selection plays a larger part than formerly and construction less, but both remain problems. Harap gives us some enlightening data in the field also. He has found in his study that wage earners have difficulty judging the value of materials, particularly wool; the amount of money spent shows that they buy inferior quality; the amount of money spent for clothing is much less than that recommended in standard budgets; they do not consume a sufficient quantity of some half-dozen important articles of clothing; the desire for display and fashion exerts too strong an influence on selection of clothing, and too much extra is paid for artificial values. We see the need here for establishing better habits and standards as we did in foods. Girls must have experience in judging and evaluating materials; we need to stress what garments should be in the wardrobe. An understanding and appreciation of art principles and values to guide them rather than fashion alone should be developed. More attention needs to be given to a study of the hygiene of clothing. In the light of these facts we certainly are not justified in devoting the major part of a clothing course to construction.

In connection with a study of housing, Harap feels that there is need for the homemaker to know good housing standards, the value of various building materials and the advantages and disadvantages of renting and owning a home. The homemaker should see the importance of conveniently arranged rooms and working units. Women have been slow to realize that time and effort are valuable and that much is lost through poor arrangement in the home.

The furnishing and equipping of the home is another of the homemaker's activities, and here again the saving of time and effort should be stressed. Other things that need emphasis in connection with furnishing and equipping the home are usefulness and comfort. The home should be comfortable and restful and furnishings should be of such type and quality that they can be used without constant fear of injuring and spoiling them. Girls should be led to see that things in the home are there to be used and enjoyed and things too delicate for use are a source of concern to the homemaker. The home and its furnishings are valuable in so far as they contribute to the comfort and happiness of the family.

The public is beginning to recognize that health is one of our outstanding needs. In the study made by Dr. Charters we find that the trait of the homemaker judged to be most important is care of health. Dean Russell, in his discussion of vital things in education, to which we have already referred, emphasizes the importance of health training in education in the following manner:

> When you ask me what counts most in education, I have no hesitation in putting to the front good health. I cannot think of anything worth attaining in life for man or woman that will not be worth more, that will not give more joy, satisfaction, and zest to life if good physical health accompanies it.

People have so few physical activities in these days of automobiles, cars, and elevators that one of the things to be stressed in health education is the need for exercise and muscular development. Physicians tell us that people should be trained to realize the importance of regularity in habits and simpler living, also to know what conditions make for mental health. Probably the outstanding objective in health training should be the development of appreciation of good health and its importance.

If we are to keep the home-economics curriculum up to date, it is necessary not only to make changes in the work already in the curriculum, but also to investigate and include training in phases of the work that have recently developed problems or have been neglected in the past because we have not been awake to the need. Two of these new phases of work are in connection with the most vital interests in life, child development and social relationships inside and outside the home. The former has developed so rapidly and has become so important that the homemaker is eagerly seeking help. We see evidence everywhere of this recognition of need on the part of parents. They are cooperating with nursery schools, women request the work in evening classes, women's clubs and other organizations are including it in their programs, and even papers and magazines are giving considerable attention to it. Parents have found that the old method of coercion will not work in training the modern child, so they are being forced to abandon it. But they failed to find a better method before giving up the old, therefore there is a lack of disciplinary training, and as a result behavior problems are developing and the parent is seeking help. Should not parents in the future have a better understanding of the lives that are in their charge? Shall we teach everything else in our schools, whether we can see any real use for it or not, and neglect to give the future homemaker principles to guide her in feeding, clothing, and developing her children. Dean Russell says that the needs of the child should not be mysteries known only to experts. The first question to be considered, he thinks, is not what school shall we send the child to, but what shall we give him to eat? In connection with this he tells of the shock he received when he called a physician to diagnose the illness of one of his children, and was told very bluntly that the primary trouble was lack of food. We do not have time nor available material to go into this subject deeply with high-school girls, but we can lead them to some understanding of the development of good physical, mental, and social habits; what foods the infant and pre-school child should have; what type of recreation will help him to develop normally; what and how much clothing is necessary for the child's health and comfort; how to win a child's confidence and develop a feeling of comradeship. Though the work cannot be intensive, it should develop a desire on the part of the high-school girl to watch and study children and to find out more about them. Adult education is helping the homemaker today to solve her problems after they have developed. It would be far better, however, to be prepared to start right and prevent the trouble rather than to remedy it after it has arisen, especially when anything so vital as a child's welfare is concerned.

The other problem that is challenging those really interested in the home, that of social relationships, is also complex and difficult to approach. We are realizing that the homemaker may be efficient in providing for the physical needs and comforts of her family and yet not know how to bring about happiness and good cheer in the home. The mother is not alone responsible, but she can do much if she is equipped with intelligence and knowledge. Industry no longer binds the home together, the only bond is that of common interest; a bond of choice, not of necessity. It is most essential then that members of the family have right attitudes toward the home and each other. Every girl should develop an appreciation for the home and its function in society, and she should have a firm conviction that it is an indispensable institution. Along with this appreciation of home should go a realization of the responsibility involved. If the home is to be the right kind, every member of the family must be a contributor, must be willing to bear his part of the family load cheerfully. The high-school girl should be led to look at her own situation and see whether she is receiving more than her share of the income, time, effort, consideration, and attention. If she is, she should be led to see in what ways she can contribute more and expect less. If girls have the attitude of expecting always to receive and never to give, they will not be successful homemakers. They must feel the responsibilities of the homemaker, and the need for cheerful cooperation, patience, and unselfishness. They will have more respect for the home if they realize they must strive to be worthy of it. Other questions to consider are: How shall leisure be spent? What can we provide in the way of worth-while recreation for the home? What books and magazines will help to make the home more attractive? What shall be our basis for choosing friends? What is involved in friendship? How shall we provide for the entertainment and enjoyment of friends? What responsibilities do members of the family have with regard to community, state, and nation?

We come now to one of the homemaker's most pertinent questions, How can one person carry on successfully all of these activities? The answer is, She must be a good manager. To be successful, the homemaker must so manage her time, energy, and money that she can give each responsibility the attention it deserves. Good management involves a knowledge of relative values, it means the putting of first things first. We haven't realized in the past the importance and far reaching effects of good management. Miss Richardson, field worker in Parental Education and Child Development for the American Home Economics Association, tells us that those who work with behavior problems in children have found that some of these develop because mothers do not manage well. Girls should see the importance of regularity in family habits, and that this depends upon good planning of time; they should understand the making of a time budget and its value; they should realize that utensils or equipment or furnishings that are not useful, or that require constant care and the spending of much time and money in upkeep, should not be tolerated in the home, however fashionable or popular they may be; they should become acquainted with the labor-saving devices that are within their means to procure. A study of the things suggested above is not, however, the only essential in developing managerial ability. The girl must be given opportunity to manage, and there are many such opportunities in school. It will help the girl to be a better manager to have the responsibility of getting classwork done on time, keeping towels clean so they will not have to be washed every day, keeping the floor clean, planning for a definite amount to be done in a given time in serving, calculating the amount of time that is required for the preparation of certain products so that it will be possible to discriminate against those with long, involved processes. Stressing the relation of cost and value in home economics work will give a better understanding of wise use of money.

We have considered briefly the homemaker's new problems and the phases of old problems that need most attention. The next consideration then is, How shall we organize the curriculum so as to provide the new work? Two ways of doing this have been tried, first, by teaching all phases of the work in units; and second, by providing for the new work as a part of courses already in the curriculum. The latter method is possible because of the close relationship between the new phases and the phases now being taught. Child development can be taught as a part of courses in food, clothing, management, and hygiene. The feeding of children can be included in the foods course. This would involve principles of habit formation since the establishing of right food habits should be stressed. A study of selection and construction of clothing for children could well be a part of the clothing course. The development of habits and attitudes such as independence, cooperation, unselfishness, and helpfulness, could be taken up in connection with management since the efficient manager expects the help and cooperation of her family. Much of her time and effort can be saved by training children to wait on themselves and help with home tasks. Providing wholesome recreation for children should be one of the important items in the time budget. Appreciation of the home and conditions necessary for happy family life, as well as the consideration of the girl's share in what the family has to give, is also closely connected with management.

Providing for the entertainment of friends, courtesy, and social usages, could come in nicely in foods in connection with the preparation and serving of meals. The girl's responsibility to the family can be included in foods, clothing, and management courses. An earnest study of these things will lead to the development of right attitudes toward the home and the family. If girls see what the home means to them and the many responsibilities and tasks of their parents, they will have a desire to help, and a more desirable relationship will exist between parents and children.

There is a danger, however, in thus introducing the new work into the old courses, that it may not receive the time and attention it deserves. If it comes in incidentally and is passed over quickly, the girls will not have time to understand it or to develop real interest. Definite plans must be made for the new work and sufficient time must be allowed.

The unit organization in home economics training has much in its favor. When, for example, a course in child development is given, the interest and attention are centered on this particular phase of the work with the child as the center of interest. It is hard to bring about this emphasis when a part of the work is taken in various courses. The latter method, however, shows the close relationship of the new phases of work to the old.

A number of questions have arisen in connection with the teaching of the new work. First, are our teachers prepared to teach it? At the present time teachers are not prepared as well as they should be but that is the situation when any new work is introduced. Home economics departments are, however, beginning to provide for definite training by having classes in child development and nursery schools for actual observation of children. Where there are babies in the home-management houses, the girls learn about the physical care of infants and something of habit formation. Much help can be given the untrained teacher by means of an outline worked out with the help of a specialist. Round-table discussions where teachers can find out what the others are doing will be beneficial. In social and family relationships there is little, if any, definite provision for training the teacher except in sociology courses and personality development, but the interested teacher who sees the real need for it can give something worth while to her girls. Here again outlines can guide the teacher in working out a unit. The need for training in this field is being felt, and it will probably not be long before there is definite provision for it.

Another closely related problem is, Where can we find text material that is suitable for the high-school girl? This is a real problem, especially in social and family relationships, because there are practically no books on this topic. The new book, *Social Problems of the Home,* by Professor Groves of Boston University, is intended for a college text, and is therefore not suitable for the high-school girl, but the teacher could make use of it in preparing material for her class. Dorothy Canfield Fisher's books have considerable in them that is usable. *The Business of Being a Friend,* by Charlotte Conde, can be used by the high-school girl, and it gives an excellent conception of the meaning of friendship. Edgar Guest's volume of poems, *A Heap of Livin',* is much enjoyed by girls and gives them ideas of pleasant home relationships. Our home economics textbooks have here and there chapters that are excellent. The first chapter in Miss Matthews' book on *Elementary Home Economics* is an example. Our teachers get much of their help, however, from magazines and papers. In a number of schools the teachers have files of articles from magazines and periodicals. We have less trouble finding material on child development, for there are a few books, such as *Child Training* by Patri and *Wholesome Childhood* by Groves, that are written in such a manner that the high-school girl can understand and enjoy them. There are many state and federal bulletins and pamphlets; the child welfare organizations also put out usable material. The new magazine called *Children* is proving helpful, as well as *Hygeia* and *Food and Health Education.*

A third problem is, How much time should be devoted to the new work? If taught in units, how long shall they be and when shall they be introduced? The amount of time that we give to these phases is relatively small, due to the lack of training on the part of teachers and lack of usable material. Our teachers are now giving from four to six weeks to child development, and three or four weeks to social and family relationships in the two years of work.

We feel that the units should be taught at the time when the teacher can make them most vital. We have found that a unit in social and family relationships can well follow a food unit, coming just after the preparing and serving of a meal. Girls often entertain guests when serving meals, and provision for the comfort of guests can lead nicely into other social relationships. A unit on child development can follow a food unit, since some attention is given to the feeding of children in foods classes.

The last question, and one that is often asked, is, Are girls interested in these new phases of the work? Our experience has been that they were much interested in child development, especially when provision has been made for contacts with real children. Some of our high-school girls have shown keener interest in this work than in any other home-economics work, and they are sorry when the unit is finished. Their interest is shown by the time and effort they spend in trying to find help on some child problem, or in making a report on some topic connected with the work. Our girls in Teachers College High School were allowed to go to the Home Management House to see the baby have her bath, and to visit the nursery school, and they were very enthusiastic over what they saw. We find that since they have had their Child Development unit they talk about children more and notice how they act, the care they receive, and what they eat. Because of this, we feel that it may be wise to have the work divided into two units, one to be given the first year and one the second. The first unit would stimulate an interest in children so that girls would study them and be able to receive more help from the second unit.

We have been pleased with the interest that is shown in the study of home relationships. The girls have done excellent work in criticizing books and magazines to determine what should be selected for the home, and I have heard the *True Story* magazine forcefully condemned. They have discussed wholesome recreation and made plans for enjoyable evenings at home. They have determined how they could be most helpful to their mothers and have a desire to understand and live up to a real standard of friendship. We have found no lack of interest in these new types of work if the teacher believed in it and put forth sufficient effort to collect available material.

We have been discussing how we can bring the home-economics curriculum up to date so that the training given will meet the present need. Now if we are going to keep it up to date we must follow the same procedure: first, keep our objective of training for efficient homemaking constantly before us; second, keep in touch with the activities that the homemaker is required to carry on, and find where she is least efficient, and third, so change our curriculum by adding or eliminating that we provide for training in all phases of the homemaker's work and place especial emphasis on the activities in which she is least efficient. As we see how many and varied the activities of the homemaker are, we are appalled by the breadth of our objective. It seems a task impossible of accomplishment. We are accused of trying to make our girls jacks of all trades and masters of none, of trying to cover too much territory, and of not giving sufficient attention to any one thing. We plead guilty to this, in part at least, but which phase of the work do we dare leave out? Probably some elimination is necessary, but it should be the unessential things in the old courses to which we still cling because of tradition. We must constantly examine what we are teaching, since we have no time for things not vital.

Whether or not we shall develop through our training a more efficient homemaker, is going to depend *on how* we teach as well as what we teach. The present need is for the homemaker who thinks clearly and independently, has initiative and resourcefulness, and sees her problems. If we are to develop these habits in our girls, we must give them the work in such a way that they will be called upon to think, to judge, and to use initiative and resourcefulness; for it is only through practice that these habits develop. If we are able to produce with such habits a degree of skill and a keen, vital interest, the girls will continue to develop after they leave us, and after they go into their own homes.

Dewey tells us that education is growth and development, and that the criterion of school education is the extent to which it creates a desire for continued growth and supplies means for making the desire effective in fact.

TEACHING BUYING

Rosamond C. Cook
University of Cincinnati

Economist and trade reports agree that women either spend or influence the spending of 90 percent of the family income. To this add the fact that the total income is $2,500 and less for 86 percent of the families in the country and the problem of teaching wise spending is one to cause anxious hours to the home-economics teacher, for it is the children of the homes of this group that fill our classrooms.

Accepting education as the sum total of all the influences which modify, change, or control the thought or action of the individual, and progressive education as the growth of the individual to new levels of thought and action, we look about us to take stock of the other influences which either aid or retard the development of the child in the field for which we as home-economics teachers are responsible.

Checking the list of influences which modify the buying behavior or habits of the consumer, we find early home life; social and economic status; association with others of this group; reading of books, magazines, etc; the theater and movies; window displays, and other forms of advertising. Indeed, an analysis of the advertising field with its methods and means convinces us that we cannot fail to recognize it as a very potent, if not the most potent, influence in the life of the individual of today.

What is the aim of advertising and how does the advertiser view the consumer? Poffenberger in the *Psychology of Advertising* says, "The aim of advertising is the prediction and control of behavior in a specialized field of activity; namely the purchase of goods." Brewster and Palmer, in *Introduction to Advertising* state that "Advertising is purchased publicity, directed according to a definite plan to influence people to act or to think as the advertiser desires." Mahin, in *Advertising*, says "People are willing to assume responsibility (of using their own judgment regarding the quality of goods) because they do not realize how worthless their judgment of value is."

Recognizing the fact that all products have economic or work value as well as psychological values and that the economic values are inherent in the goods—the result of choice of raw stock, plus manufacturing processes and procedure—while the psychological values lie in the mind of the consumer only, many advertisements have been examined to see what this group of 86 percent are being sold. The investigation attempted to ascertain whether definite knowledge of the economic value of the product plus the psychological values alone influenced the purchase. The following list of factors by which the buyer is influenced is the summary of this study:

1. Must do as other people do, also imitate people of supposed superiority.
2. The supremacy of style value in goods.
3. Superiority of the individual as proved by the ownership or use of the particular product.
4. Fear of results of various kinds, accruing from lack of use of said product.
5. Attraction of opposite sex attained by use of product.
6. A belief in the superiority of the brand name, without definite facts to prove said superiority.
7. Faith in the dealer's honesty based on length of business life.
8. Statements of economy without definite verifiable facts to prove statement.
9. Reports of "tests" to prove superiority—without information of technique of test.
10. Ideals and standards of living which can only be realized by those in the $5,000-$10,000 class are taught to be considered indispensible to all regardless of economic status.

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

HOWARD L. BRIGGS, *Director, Vocational and Practical Arts Education, Cleveland,* Presiding

PRACTICAL PROBLEMS IN CURRICULUM CONSTRUCTION

ROBERT H. RODGERS
Division of Vocational Teacher Training and Research, Milwaukee Vocational School

The first concern of any educational institution carrying out a program of work is to ascertain definitely what a community expects of its citizens. This is particularly pertinent to the organizer and administrator of vocational education who must plan for the many thousands of young people about to engage in active citizenship careers.

An analysis of the basic privileges and responsibilities of citizenship leads to the following summary of the standards. A community expects every citizen to observe the health habits and the moral standards which insure to the highest possible degree his personal well-being and happiness; to understand and cooperate willingly with established laws, accepted customs, and the approved agencies and institutions; to earn, save, and spend legitimately in order to insure to his dependents, to the people of the community, and to himself the means for a livelihood and for recognized pleasures and advancement; and to live, work, and play consistently with a full recognition of his cooperative responsibilities to the members of the family, his associates, and the people of the community.

An educational program should also concern the learner and his capacities. This involves a scientific procedure in diagnosing the needs of individuals, the selection and the arrangement of social experiences for instructional purposes, and finally the incorporation of the selected social experiences into the life of the learner in an orderly and efficient manner.

These two major elements are basic or foundational in the curriculum problem. One indicates the source and the general specifications of the fundamental instructional material; the other points to the learner as the individual for whom the educational institutions exist. The modern curriculum is based on these two elements and is the instrument of the educational system to aid in bringing the individual into social harmony.

The general foundations of the curriculum have been presented because they are basic to the succeeding stages of the discussion. The foundations are the principal source of the content of the curriculum and the controlling factors in selection, organization, and instructional procedure.

Recognizing the significance of the foundations, the next practical step in curriculum construction is the establishment of the objectives. To illustrate the relationships of the foundations and the objectives it is pertinent to take as one type the full-time vocational school of less than college grade. It may be a school devoting its activities to the preparation of young people for the trades, homemaking, agriculture, or the commercial pursuits. A second type may well be a part-time vocational school concerned with the educational problems of the vast numbers of young people who have left the full-time institution. A third type, to illustrate the relationship between curriculum foundations and the objectives, may be the subjects in practical arts.

The objectives of the first type, the full-time vocational school, provide experiences that shall result in the development of needed personal health and moral habits and of wholesome recreational pursuits that result in an understanding of and a willing cooperation with the established laws and accepted customs and, further, in an understanding of the organization and development of the basic institutions that bring about some definite preparation for a selected life work that provide for the use of the earned income to the joint advantage of the individual, his family, and the community; and that produces the set-up and following of a personal plan of life based upon the foregoing objectives. A comparative analysis of the five stated objectives and of the foundations shows a close relationship. The community desires for its citizen the development of desirable health and moral habits; an understanding of the laws, customs, and institutions, and a readiness to cooperate with them; the selection of a suitable life work and some preparation for it; the utilization of income for the best interests of all; and, a plan of life based on the foregoing elements. A careful appraisal of the objectives of the vocational school and the community's desires shows the closeness of the relationship.

The objectives of the second type of educational institution, the part-time vocation school, will now be viewed in the same manner as those of the full-time school. Again the foundations of the curriculum must be the source for all of the material. The basic conditions surrounding the work in these two types of institutions differ. In the full-time school, the students have selected their life work and are preparing for it. In the part-time school, students have gone to work, usually without vocational guidance and are recognized wage earners. The relation of the objectives in the two different types of schools are: those involving the health and morals, identical with those of the full-time school; those pertaining to the understanding of and the cooperation with, laws, customs, and institutions are wholly the same as in the full-time school; those providing experiences that will result in the selection of a suitable life work and some definite preparation for it—this provision for the vocational guidance element was not directly a responsibility of the full-time vocational school; those providing experiences that shall result in the immediate use of the earned income to the joint advantage of the individual, his family, and the community (the working youth has an income, whereas the full-time student has not; hence the need of this consideration); and, those developing a plan of life urgent in both types of institutions.

The third type of work selected to illustrate relationships between the practical arts is not a school, but a group of similar subjects offered usually within a full-time school. The objectives of this field of work are: to provide a practical form of educational guidance in selected vocational fields; a limited amount of skill in the more important vocations and selected information pertaining to materials, construction, tools, and utensils; and, selected related information of a scientific, economic, and social nature that will aid the student to understand more fully the fundamental institutions and his relationship to them.

As an analysis is made of these objectives, it is apparent that their source is also in the foundations of the curriculum. It is evident, therefore, that educational activities for young people on the threshold of adult life should develop from the specific demands that the community makes upon each individual.

Before proceeding to the details of setting up a curriculum, it is desirable to be in accord on terminology as applied to the problem. The curriculum, as the term is used, is the complete range of organized educational experiences available to a learner in an educational institution. For example, there is the curriculum for a vocational school, one for the junior high school, another for the elementary school. The curriculum in each instance is made up of numerous subjects which in turn are usually organized in the form of courses of study or, as they will be called in this discussion, outlines of instruction. The latter division is made up of many subdivisions that will be called units of instruction.

Thus far, the discussion has attempted to point out the source of the curriculum material and the general nature of the objectives that may well control the educational endeavor in the fields in which we are especially interested. The present stage of the discussion calls for an answer to these questions: How will the actual instructional content be selected? How will it be arranged for teaching-learning purposes?

The first constructive step in developing the curriculum was taken when the general objectives were abstracted from the foundations or the demands that the community places upon every individual. Following the determination of the general objectives is the need for a minute analysis of each one of the fields of human activity included in the foundation. Analysis, as the term is used here, is the scientific classification and arrangement of the content of a specific field with due regard for the relationships existing between each and every part. The procedure of analysis may well be carried on without reference to the teaching problem.

The next step is the problem of selecting from the mass of material that has been classified by the analysis, the content that will enter into each one of the specific fields that are to be taught. The procedure of selecting the detailed content is one of the most difficult problems in curriculum construction. Answers to the following questions may aid in this selective process: Does the selected material contribute toward the accomplishment of the objectives? Is the material of enough importance to warrant expenditure of time and effort by the student? Is the material of such a nature that the student will be able to assimilate it? Is the material of such a nature that results can be secured in the time available? Is the physical equipment available that is necessary to secure satisfactory results?

These criteria pertain wholly to the selective procedure which is but a part of the problem. Arrangement of the selected material in a practical manner under appropriate headings, and all property coordinated, involves careful study. The results of the arranging process should be the teacher's outline of instruction.

Following the study of the sources of the curriculum, the establishment of objectives, the analysis of the content of the numerous contributing fields, and the set-up of the teacher's outline of instruction comes the preparation of the teaching material for the use of the learner. The curriculum material is not usable until it is placed in such form that the individual educational needs of students may be served. The preparation of the materials on the outline of instruction in the form of units, is the next step. The unit of instruction may be defined as one section of a body of organized instructional material prepared for the use of the learner, and it consists of educational assignments so organized as to provide for the greatest amount of individual progress. The problem of constructing the curriculum has now been developed to the point where it is pertinent to discuss the many details of analysis and organization.

Three steps entering into the curriculum construction, are analysis; setting up the outline of instruction; and, preparing individual units of instruction. These will be approached with the thought, "How will each be accomplished?" The construction procedure will not deal with the curriculum in its entirety but with its component parts, the subjects, that is, with carpentry, bricklaying, machine drafting, homemaking, bookkeeping, and social subjects.

Analysis of the subject without regard for the teaching significance is the first concern. This involves the scientific classification and arrangement of the entire content of the selected field. Cards are frequently used for the purpose of recording and arranging the material. Large sheets are also used for the same purpose and are equally satisfactory.

The analysis involves essentially the establishment of the large general divisions of the selected field; and subdivision of each of the general divisions into the specific jobs or duties. Subdividing the specific jobs or duties in terms of the related essential information might include the following: trade science pertaining to materials, equipment, and construction; trade drawing pertaining to the reading of working drawings, and layouts; trade mathematics pertaining to the jobs or duties; trade safety essential to accomplish the jobs or duties without injury to self or others; and, trade terminology essential to understand the procedure to be followed.

Following the selection of the headings and subheadings, the procedure is one of taking each and every part of the field being studied and of arranging it in its proper place. If the card system is used, the material is placed on the card under the selected heading and filed in its proper order. If the big chart is used, it involves placing each item in the properly headed column and also in the right horizontal levels.

Trade analysis has nothing to do with teaching at this stage and so everything that is incorporated is there because it is essential to accomplishing the jobs. The analysis headings especially under the related material, will also vary according to different fields. The headings given as examples are quite characteristic of many of the skilled trades.

The set-up of the outline of instruction is definitely a part of the teaching problem. Certain general aspects have been discussed in previous paragraphs, especially the criteria of selection. Therefore it is now a matter of presenting details of procedure.

It is felt that the large chart is the most desirable means of arranging and recording the material of the outline. At the top of the chart should be the name of the field of work and a clear-cut statement of the objectives of the instructional material that is to be incorporated in the outline. The chart should be ruled to provide vertical divisions with the headings: General divisions of the subject, units and their objectives, introductory information pertaining to the unit, practical work to be accomplished in the unit, related facts pertaining to science and materials to be acquired, related facts pertaining to safety and hygiene to be acquired, related problems in mathematics to be solved, related vocational guidance facts to be acquired, and demonstration material to be prepared.

The first four headings for the outline of instruction will be common for all subjects in vocational arts. The remaining headings will differ according to the subject. Homemaking will have its variations, and likewise the commercial subjects. The following are statements of what the first four headings involve:

(1) General divisions are concerned with the basis of organization, which may be a machine, a type of construction or job, or kinds of material. (2) Units and their ob-

jectives involve clear, well-defined statements of what the teacher expects the learner to accomplish in a given period. The objectives stated on the units should definitely fulfil the general objectives stated at the head of the outline. (3) Introductory information should serve to interest and make an appeal to the learner as he takes up the assignment. (4) Practical work should list the new constructive operations or processes that are to be taught.

The next three headings pertaining to science and materials, safety, and mathematics should definitely state the specific facts that are to be studied. The final heading, demonstration material, should indicate the nature of the illustrative material that will enable the teacher to present the material of the unit in the most effective manner.

The final step in completing the outline is filling in the subject-matter for each unit. The material is so placed under the various headings that, by reading horizontally, the entire content for each unit and the succeeding units is readily discernible.

The outline of instruction, if properly organized, serves as the teacher's guide. The final step, making the material on the teacher's outline of instruction available for the learner, now remains to be accomplished.

A curriculum has value and serves only when its innumerable elements or parts are made available to the learner. The analysis is but a means to this end; likewise the teacher's outline of instruction should function in a similar manner. The organization of the curriculum in the form of units of instruction for the use of the students is, therefore, the final stage.

The outline of instruction was set up unit by unit, each one consisting of approximately one day's assignment. The procedure now entails taking from the source, which is the outline, the material and arranging it in the form of units for the learner. The unit of instruction, as it has been defined, is one section of a body of organized instructional material prepared for the use of the learner, and it consists of educational assignments so organized as to provide for the greatest amount of individual progress. It may appear that the preparation of individual units is a matter only of transferring the material from the outline. However, the outline is only what the name indicates and, therefore, must be expanded to include assignments, problems to be solved, subject-matter, and sources of information.

A well-prepared unit of instruction, in order to be wholly educational, must be prepared according to rather definite standards. These standards may be grouped as follows: (1) The objectives of the unit must be stated so clearly and directly that learners will readily understand them. (2) Students must be introduced to the new assignments in a manner conforming to accepted pedagogical practice. The principle of appreciation cannot be slighted. This will require a short introductory paragraph, carefully planned for each unit. In the outline of instruction this has been called introductory information pertaining to the unit. (3) All assignments under each of the various headings on the unit should be so clearly given as to enable each student to undertake his work without loss of time. Arrangement of the material in the unit and illustrations cannot be overlooked. (4) All assignments on the units should involve the solution of an educational problem calling for the best efforts of the learner. Merely specific directions for carrying out a certain number of manipulative operations is in violation of the principle of self-activity and should be used only in a very limited way. First units may give specific directions, but succeeding units should gradually place more and more responsibility upon the learner. (5) All assignments on the units should be progressive, thereby tending to insure the learner's progress. (6) All assignments on a given unit should be as closely coordinated as is possible, thereby making the technical information more vital to the learner. (7) Provision should be made on each unit for the learner to record his procedure or his knowledge of essential information as he develops the assignment. The units after being worked on become the property of the student. (8) The assignments on each unit should preferably cover only one day's work. This should assist the student to complete a very definite field of work each day and, with its completion, to carry away a sense of accomplishment. A reasonably close observation of these standards should result in the drawing off from the outline, subject-matter, and problems in such a form as to make the innumerable elements of the curriculum available to the student.

The discussion of the entire subject, "Practical Problems in Curriculum Construction," has been concerned with the basic situations confronting anyone concerned with the development of the subject-matter for a vocational school or a department of practical arts. It seemed desirable to present the source or foundations of the curriculum, thereby indicating in definite terms the relationship that should exist between the demands of the community and the organized educational program; to view critically the community's demands and to determine from them the educational objectives for the various types of schools; to view the basic elements that must enter into the problem of constructing a curriculum; and, to present the practical steps to be followed in carrying out the innumerable details involved in building a curriculum.

Finally, this entire plan is not an effort to crystallize human experiences or to standardize them; it is rather a means to aid in keeping the curriculum alive and abreast with the everchanging community life. All of this procedure is for the sole purpose of scientifically preparing the innumerable desirable experiences that they may be available in such proportion and at such times as to serve the individual needs of the learner.

THE SIGNIFICANCE OF THE STUDY OF INDUSTRY AS A SCHOOL SUBJECT

Lois Coffey Mossman
Teachers College, Columbia University

How important is industrial arts as a school subject? Is it a subject, or a technique or method of work valuable in enriching the various school subjects? Does it have a body of content? Is it a fad or a frill to be dropped when retrenchment is necessary? Is it vocational in its significance? Does it rank as a cultural subject? Is it suitable as a subject of study for those only who will be workers with their hands? Does it offer any values for those who will go into the professions? Is it particularly valuable for the handicapped? Is it in any way related to the other school subjects? Just what do we mean by industrial arts? Is it a subject that concerns all teachers of children?

To understand why answers to these questions do not agree we have but to trace the history of the use of materials in the teaching of children. In 1860, the kindergarten brought materials into the schoolroom in its "gifts" and in its use of sticks, peas, straws, beads, and bright-colored papers. This use was formal and was designed to bring about moral development in the young. The emphasis upon exact manipulative dexterity was stressed because of the disciplinary value in the formation of character. The protagonists for object teaching brought materials into the classroom, about the same time, in the form of specific objects were attached and memorized.

A formal type of sewing, laying much emphasis upon samplers and practice exercises, came into this country as a result of an exhibit at the Centennial Exposition of work in this field by some European countries. It was seized upon by the philanthropically-minded in some of our eastern cities who saw in it remedial values in alleviating the conditions of working girls whose educational opportunities had been all too inadequate. Soon after the establishment of schools for these philanthropic purposes, the work was taken over by the public schools and diluted as it was introduced lower in the grades. This origin of textiles and sewing accounts for the utilitarian and vocational emphasis placed upon this subject and similarly upon its companion subject, cooking.

The same Centennial Exposition brought to this country another trend in the use of materials. This was the manual-training movement which is traceable to the exhibit of the Della Vos in the Imperial Technical Schools of Russia, where an extremely formal type of manual training was taught in the vocational training of young men who were to become engineers. The work was immediately incorporated in the curriculum of the Massachusetts Institute of Technology, which had a definite vocational purpose, and was taken up soon after by a number of high schools where the objective was avowedly cultural, reliance being placed for the acquirement of this cultural value upon the doctrine of the transfer of training. Like cooking and sewing, this subject was pushed down in the grades in a diluted form which adhered to the extremely formal aspect of the work.

Even as these subjects were being pushed down, as low as the fifth grade where wood whittling was often found, so the kindergarten precedent, aided by object-teaching, was pushed to the higher grades in the form of paper-folding, mechanical drawing, stick-laying, knitting, crocheting, embroidery, and an abstract sort of drawing. Formal drawing came into this country, just after the entrance of the kindergarten, from England, with special stress upon its vocational aspect. These varied sorts of work became so confused that many teachers lost sight of the educational objectives and merely resorted to handwork which they openly and frankly called busy-work. With such a history one cannot wonder at the diversity of opinions as to the educative value and objectives in the use of materials in the school room.

The educational objectives in teaching industrial arts.—Suppose one were free to set aside traditions and put the work with materials in the schools upon a basis that is really as educational as work in any other subject. What would be the objectives of the work? Professor Bonser has proposed that anything is of educational value which makes a desirable difference in the control of conduct. Applying this to our question, we must ask what the conduct of children already is, relative to industry and its products. How does industry touch their lives? In answering this we are forced to say that children encounter industry in the choice of its products, in the use they make of its products, and in the formulation and expression of attitudes and appreciations of industry and its products. Anything that education attempts to do in teaching industry should concern itself in the betterment of this conduct. Indirectly such work will gradually build up a body of experience which should become valuable in helping the child find his vocational interest and better prepare him to enter that vocation.

The field covered by the subject.—How large is the field of this subject? To cover its objectives, all the dominant aspects of life to which industry contributes should be included. The most fundamental needs which industry supplies are:

1. Food
2. Clothing
3. Shelter, including furnishings, heating, lighting, ventilating, sanitation, and decoration
4. Records of human experience, including books, newspapers, and magazines
5. Containers to hold possessions—vases, crocks, jugs, dishes, baskets, boxes
6. Tools and machines—the devices by which we do our work through overcoming distance and limitations.

Whatever will make conduct more desirable toward these industrial products and the work of supplying them should be included in the field of industrial study.

The content of industrial study.—What shall one study relative to foods? What knowledges, skills, appreciations, and attitudes can be acquired through school study to bring about the desirable changes in one's conduct toward clothing or books or dishes?

The subject should consist of experiences which shall result in knowledges, habits, attitudes, skills, and appreciations which will bring the desired conduct. The attempt to classify these experiences results in this category of possible subject-matter involved in studying food or clothing or any of the other six fields suggested for the study of industry:

1. The fundamental processes involved in making the raw material into the needed products.
2. The story of the progress of the race in developing these processes from the simplest hand method to the modern machine method.

3. The materials used, including their source, value, limitations, and possibilities.

4. The science underlying the construction processes and the science involved in use of the products.

5. The hygienic, economic, social, and aesthetic values involved in the production and use of products.

The teaching methods best suited to attaining the objectives sought.—In the days of busy-work, the method by which the school sought to attain its objectives was obviously construction, as that seemed best suited to the problem of keeping children busy. This seems to be a frank admission that construction is time-consuming. It is not only expensive in time but also in money because of the cost of materials. A conscientious teacher who guards the children's time or the public money should not resort to construction as a method of teaching if any less expensive method is available which will give the desired results. Some learnings, however, cannot be gained by any other method. It is doubtful if one can by any other procedure gain the meaning of a coil-make bowl or a modern book. The case-cover of a book has a different significance after one has constructed and attached it to a sewed book.

What methods, then, may be used in furthering experiences in the industrial field? The following seem appropriate for consideration:

1. Construction, valuable for first-hand experience but expensive in time and materials.

2. Observation, useful where workers are accessible. An excess of this fails in that the learner does not get the experience of doing the work himself.

3. Demonstration, of use where workers in industry are not accessible and where the children need to see the process. It too has little of first-hand experience.

4. Excursion (to a factory, to the source of raw materials, or to shops, and museums) gives an experience including more of the environmental aspects of the industries than do demonstration and some kinds of observation. Conditions attending the work are thus made apparent.

5. Experimentation, an effective way of teaching the im-

plications of the industry and of the use of its products. Trying a thing out to see what will happen is a good method of developing the inquiring attitude.

6. Investigation, used in teaching children how to gather and organize relevant data.

7. Collecting samples of materials, processes, and products illuminating in the widening of experience.

8. Reading, useful where library facilities are available.

9. Discussion, helpful in clarifying ideas and in sharpening thinking. The study of industry should not be limited to any one of these methods but should utilize each as it best lends itself to the development of desired conduct.

The relation of this work to the other school work.—Each subject in the curriculum is valuable as it develops aspects of human life. Much of life is tied up with the activities involved in meeting the needs which industry supplies. We therefore find much of one's quantitative thinking is thinking related to his industrial experiences. The artist, the poet, and the musician, in their attempts to depict significant human experiences, often select those bedded in industrial life. In industry's continuous effort to provide for human needs are to be found many of the significant rhythms of life, and the deeper human emotions are often related to the struggles involved in providing life's necessities. The history of man's progress in providing better living conditions through the services of industry is closely related to the entire story of man's progress in achieving civilization. Science and geography give an understanding of the factors conditioning industrial life. This study of industry is, in fact, intimately related to each of the school subjects because it gives experiences which are vitally related to life. The study of one's relation to industry and its products is of genuine significance to all who would live richly and efficiently.

JOURNALISM

ROWENA HEWITT LANDON, *President, Journalism Association of Ohio Schools,* Presiding

THE NEWSPAPER: A LIVING TEXTBOOK

H. M. HARRINGTON

Director, Medill School of Journalism, Northwestern University

On Sunday morning recently our minister paused in his reading of announcements for the week to insert a notice just relayed to the pulpit by an obliging usher. The notice ran something like this:

> WANTED—An energetic teacher for a class of live boys in the Sunday School. He must be interested in us and our affairs, be able to tell a good story, know how to connect up the Bible lessons with everyday life, and also act as a good example. Applicants apply to Miss Dorothy Harris, director of religious education.

"This want-ad was written by the boys themselves," commented the minister, with a smile. "I don't know how many members of this congregation consider themselves capable of filling the job, but there's no doubt in the minds of these boys as to the kind of teacher they want."

A few days later, three business men who enjoy wrestling with knotty problems said they would like to be considered for the position. One of them—a newspaper editor—is in charge of the class today, and is having the time of his life making religion interesting to boys.

I don't know whether a want-ad has ever served as golden text for a modern preacher or not. I don't see why it shouldn't make a fine starting point for a sermon. Nothing is so expressive of a human need, honestly and simply told, as any want-ad. If one desires a familiar close-up of men and women, he should collect some of these little waifs huddling on the back porch of the newspaper.

I am going to adopt the methods of the preacher today, using as a text this little notice written in a boyish scrawl and flung as a challenge to a company of smug city folk. Just as a botanist pulls a flower to pieces petal by petal, I shall attempt, in this little homily on the newspaper as a living textbook, to pluck out the various implications of our want-ad, and then show how its lessons may be applied to our daily task in the classroom.

Notice in the first place that the boys want an *energetic* teacher. I think that word *energetic* is rather arresting, because all of us are as lazy as we dare to be. We are too prone to dip down into the barrel and to bring out old ideas, old conclusions, and prejudices arrived at some years ago—and not carefully scrutinized since. When I was a Freshman in college I studied Greek from a second-hand manual in which a former sufferer had carefully noted just when I might expect a mild jest from the instructor. The schedule was clock-like in its regularity. At the right moment the alarm went off, and the class laughed uproariously, especially those of us in danger of flunking the course. Well, I marvel how any teacher, harried and hurried as he may be with other duties, can find any real and continuing satisfaction in teaching when the subject no longer beckons to his mind, no longer opens up new pathways to his exploring feet. We teachers, centered as we are in the classroom and surrounded by young people who generally accept as law and gospel what we have to tell them, seldom get the frank, sometimes brutal, criticism that comes to men of the business world where mind meets mind in open, straightforward competition.

We need to check on ourselves; to make an inventory of our mental reserves, so that we may discard shop-worn goods and replenish our shelves with fresh brands of knowledge. There is no more lamentable tragedy today than an unfurnished mind, a mind shuttered and closed to all the warming sunshine of new, invigorating truths. One of the finest things that can come to this conference on expertness in teaching is that mental batteries can be charged with "sparkling" ideas, and that fresh courage has been acquired through contact with other minds, electric with energy and still in the process of growing.

I remind you that extreme, nerve-wracking "busyness" is often confused with productive labor. You recall how the barbarian hordes once clamored at the gates of Athens. At this juncture a passerby found Diogenes frantically rolling a barrel down the city street. "What in the world are you doing?" queries the friend of the philosopher. "I'm pushing a barrel," came the answer. "In a crisis like this, everyone should *do* something." How many of us are like Diogenes, rolling an empty barrel before a gaping crowd at a time when young people ask for our best application of brain and energy, and when we might be doing some organized, rewarding work?

In the second place, please note that this is a class of *live* boys who advertise for a teacher interested in them and their affairs. I think, sometimes, we fail to realize that we are dealing with active, enthusiastic, squirming youngsters, not with "little men and women." The books these youngsters relish (if I may dip into my own boyhood memories) are not always those enjoyed and recommended by oldsters.

Youth's favorite books are stories of action, heroism and struggle, swung around daring young adventurers teetering on the edge of danger. These records are often crowded with mystery and suspense. Such materials are likewise the ingredients of the daily paper, among other things. Young people do not have to be coaxed to take interest in the printed sheet; they instantly show an eager, developing interest in it because the newspaper satisfies their curiosity about the life around them as centered in real people and real events.

One of the encouraging signs of the times is that the newspaper has followed Mary to school. It is having a share in the education of boys and girls, all of them tremendously interested in current happenings. The newspaper headlines tell of competition, struggle, achievement, victory, adventure—all bugle calls to youth. The young overlook defeat, and perhaps are not so greatly interested in scandal, murder, and crime as are their sensation-hungry, critical spirit of hard-fought battle and the will to win.

Most of us read and enjoy the newspaper because we find in it a little gallery of vivid portraits representing people we know in situations at once dramatic and real. We read the newspaper because it calls us by name, *Floyd, Eleanor, Irving;* because it talks about our friends and neighbors, because it is the discerning artist of the human scene. Hence, its popularity as a daily guest in our homes. The newspaper can have no substitute.

Next to ourselves and our friends, we respond most eagerly to the adventures of celebrities as chronicled upon the pages of our newspapers. President Coolidge, Mary Pickford, Charley Chaplin, Helen Wills, Queen Marie—to mention just a few—instantly lure our attention and compel our interest.

A few months ago the entire country read the story of Marian Talley, a Kansas City girl, who had made her debut as a singer at the Metropolitan Opera House in New York. Her great adventure was a triumph of youth; hence it satisfied the love of the romantic that thrills all of us. We rejoiced in her success. Behold her portrait painted by a writer for the *Associated Press*:

> A plump, pink and white, blue-eyed girl of 19, held a Metropolitan Opera House audience spellbound tonight with the beautiful, full tones of "Caro Nome."
>
> At the last note a storm of applause swept the packed auditorium, stopping the show for five minutes, the name of Marian Talley of Kansas City was securely inscribed on the roll of prima donnas.
>
> As the curtain fell on the second act of Verdi's "Rigoletto" the applause broke out again, and the audience called the youngest prima donna ten times before the footlights before they would let her go.
>
> The huge auditorium resounded with shouts of "Bravo" and "Talley."
>
> Seated at the sending end of the special leased wire of the Associated Press twenty feet away from the scene of his daughter's performance, Charles M. Talley sent the first words that told the world of the successful fulfilment of his dreams.
>
> Back stage there drifted the murmur of the audience, still excited over the startlingly mature voice that had come to them from the throat of the little Kansas City girl.
>
> Mr. Talley ticked off over the keys the following message of his delight:
>
> "The things that the Talley family have been dreaming of for fifteen years have come true.
>
> "Our little girl is singing to the world, as we always thought she could some time do and would do.
>
> "CHARLES M. TALLEY."

Glenn Frank, president of the University of Wisconsin, and a former editor of the *Century Magazine,* makes this pertinent comment:

> I should like to see an educational experiment made in which the only textbook used in the education of a group of students would be a good daily newspaper, with widely-informed and alert-minded teachers simply reading over the newspaper with the students, and attempting each day to ferret out the background information necessary for a real understanding of the news.
>
> Granted an adequate degree of intelligence in the students and teachers, I venture that in four years or less we could produce a more thoroughly educated and more broadly informed type of graduate than by the more or less helter-skelter process of an extreme elective system under which students may learn a great deal more about a great many things without ever relating his knowledge to current human affairs or seeing present-day society as a coherent whole.

A good newspaper, then, is the story of the world's progress told in linotype slugs. It should be used in the schools as a living textbook, in connection with formal literature, to keep children in intimate touch with the life of today. Books become stale and out of date. Newspapers bring fresh tidings every day and keep the mind focused on the interesting events and problems told in the present tense. Here is history in the making, applied geography, the achievements of science, policies of government, the day book of the home town—all worth intensive study by boys and girls. Let the pupil read the newspaper critically; let the teacher discuss events with him at the conference table. I have a feeling that many teachers are reluctant to introduce the newspaper into the classroom as source material because pupils actually enjoy reading it.

When I was a boy, my father (who was a druggist), kept a big blue bottle of quinine in the medicine cabinet. Whenever any of us had an ache or a pain, particularly if we sneezed violently, we were instructed to sink a spoon into that white, villainous mixture and to swallow the dose without making a wry face. The theory was that if the stuff tasted bitter going down that it must be good for us. Well, we know better today. We are beginning to learn that the lessons of the schoolroom may be sugar-coated and made attractive, without destroying the beneficial effects of the medicine.

Of course, it is still the part of the teacher to caution pupils in the matter of choosing those things that really contribute to knowledge and understanding. The newspaper is really a literary cafeteria, where a variety of tempting articles are on display to tempt the appetite of all sorts of customers. To load the tray with side dishes to the neglect of such substantial items as bread, meat, and potatoes —the significant news of the day—is to court mental dyspepsia and encourage flabbiness of intellect. No sane editor ever expected a reader to swallow everything offered in a huge daily newspaper; he expects him to use what he can.

Suppose we immediately apply President Frank's happy suggestion. An admirable linking-up of newspaper reading with classroom procedure may be brought about by the introduction of a journalistic quiz of twenty questions, suggested by the news of the day. Read the questions aloud, give the pupils a minute or two to write a definite answer, then grade and return the papers, and announce the correct answers. The twenty queries may relate to the whole round of our common life. Constant drill in accuracy of observation is sorely needed in our schools where floundering guesses and slipshod thinking have long played havoc with young people. Another quiz may be based on an intimate study of half a dozen well-edited newspapers. These inquiries may relate to the significance of the name of the paper; the use of "streamers" and headlines; the printing of pictures, cartoons, and advertisements; the kind of stories featured on the first page; and a variety that an intelligent student of journalism should know. Here are some samples:

A WORD A DAY

(To be looked up in the dictionary and discussed in class.)

1. From a story describing a mine disaster: (a) pulmotor; (b) anthracite; (c) Red Cross relief; (d) casualties.
2. From a political story: (a) mayoralty campaign; (b) plurality; and majority; (c) run-off election; (d) referendum; (e) bond issues; (f) precincts and wards.
3. From a story concerning an international crisis: (a) consulate; (b) evacuation; (c) boycott; (d) concessions; (e) bolshevik.
4. From a sports story: (a) interscholastic; (b) tournament; (c) referee; (d) semi-finals; (e) soccer.
5. From the theater: (a) producers; (b) repertoire; (c) vaudeville; (d) legitimate; (e) screen; (f) opera.

I have no desire to glorify the newspaper. It is a public-service institution working at top speed, under constant scrutiny, to rush the news into print. It is planned by the human mind and put together by human hands. It makes mistakes due to carelessness, faulty judgment, and lapses of memory, just as does the hospital, the court of law, the church, the school. As a faithful historian it cannot pass by some of the unpleasant things of life, since these abnormal happenings are a part of the day's story.

The newspaper asks to be read by a man who knows that crime and scandal are not the usual rules of life, but the exceptional out-croppings, and hence interesting news. Pupils in the schools may be taught how to read the newspaper with discrimination. Why refuse the trout because of the bones that annoy us.

Our want-ad expressly states that a capable teacher should be able to tell a good story. I submit the newspaper as a candidate for this honor, since the reporter has long practiced the art of presenting a thrilling yarn in interesting fashion. You know how the adroit writer sets out to grapple the reader's interest in the opening paragraph with some alluring bit of information, an art which young writers need to practice diligently if they are to win an audience of eager listeners.

Here is a miniature story, swiftly told in short, compact sentences, which may be taken as typical of the reportorial method of presentation:

> Yesterday, for the second time in forty-five years, John H. Zumwait, 88-year-old Kern county pioneer, paid Los Angeles a visit.
>
> In 1882 when he rode into Los Angeles to see two straggly thoroughfares, Main and Spring streets, he remarked: "Just a pueblo, guess I'll go back to Kern County."
>
> And yesterday when Mr. Zumwait saw the giant city which had sprung from the two dusty streets, he observed: "Too much pueblo, guess I'll go back to Kern County."
>
> "Why live among all this eternal excitement when there are quiet and peaceful valleys in the hills?" the rancher asked. "Just as soon as I finish my business in Los Angeles I'm going back to my ranch."
>
> Mr. Zumwait was born in Illinois in 1839. He crossed the plains with ox teams in 1854 and settled in Sacramento. Later he lived in San Luis Obispo County and settled in Kern River Valley in 1880.
>
> "How do I keep so youthful?" the rancher asked. "Don't fool yourself. I don't feel half so young as I look. But the answer is simple; anyone can live longer out in the country."

May I suggest how this little vignette may be used as a specimen to show three laws of composition at work? Note the emphatic *yesterday* in the lead sentence, and how *unity* and *coherence* are preserved throughout the entire narrative. Note the absence of involved sentences, the simple, homespun phrasing, the series of little pictures, the frequent paragraphs to rest the eye and invite the roving attention of the reader. Human, clean-cut, vivid writing.

Young writers need to be trained in the business of telling simply what they know, without lugging in gaudy, "highfaluting" expressions and fantastic explanations. After all, the news is the thing, not what they *think* about it.

On the wall of a Seattle newspaper office hangs the attached set of instructions to reporters, suggestions that should be of value to any young writer who seeks counsel in learning how to write:

WRITE IT FOR HER

This is Mrs. John Pickrell.

She is your average reader.

She lives in a modest home which she rents at 2641 Forty-fourth Avenue, southwest.

Her husband is a steel worker, employed by the day.

She has three children, Ruth, 8; Jane, 6; and Irma, 3.

Her interests: "I don't care anything about politics," she says. "My children are my chief interests.

"I'm more concerned with what the Parent-Teachers' Association of our neighborhood is doing for the welfare of the children in the schools than I am in the activities of the League of Nations.

"I don't care much for gossiping over the back fence, but I *am* interested in the everyday affairs of my neighbors.

"I like a clean paper. I won't read one that contains stories that are unfit for my little girls to read and understand.

"I'm a Presbyterian. My husband is a Mason. Naturally we are interested in the activities of these folks.

"I'm a busy housewife. I don't have much time to read anything. But I do appreciate a newspaper if the stories are short enough. So I can read them all in a hurry."

Figure out a lead for your story that will interest Mrs. Pickrell. She is your Average Reader—one of the thousands with whom no member of the staff comes in contact. Forget the man. Write your story for the woman. The men will read it anyhow.

Write it for Mrs. Pickrell.

Writing for a newspaper is a good antidote for the studied formalities of the academic style, as often practiced by the writers of textbooks meant to cultivate the arts of composition. At its best, journalistic prose is colloquial, natural, and crystal-clear, largely because of the words chosen by the writers to tell the news. Newspapers keep our language fresh, mobile and up to date, so that it may express adequately the needs and interests of ordinary people.

The other day an editorial writer for the *Kansas City Star* summarized the matter rather neatly and convincingly. He entitled the editorial "Pompous Words." I quote several paragraphs:

> Is it worth while to keep striving for exactness in the use of words? In an age when any obscure word, particularly if it sounds learned, is seized by writers eager to be impressive, is it possible to preserve fine shadings?
>
> At any rate, brave men like Richard Grant White and Alfred Ayres have made the fight. The latest recruit is that accomplished English and Latin scholar, H. Ward Fowler, in a stimulating book, *Modern English Usage*. He lays about him right and left, exposing muddy thinking and affectations that most of us have accepted without question. "There are many common words," says Mr. Fowler, "whose use is a guarantee to the reader that clear thinking will not be required of him."
>
> Mr. Fowler sums up his views on such usage under the heading "Long Variants." He says in a passage that young writers would do well to keep before them:
>
> " 'The better the writer the shorter his word,' would be a statement needing many exceptions for individual persons and particular subjects; but for all that would, and especially about English writers, be broadly true. Those who run to long words are mainly the unskilful and tasteless; they confuse pomposity with dignity, flaccidity with ease, and bulk with force."
>
> The better newspapers war constantly against incorrect, pompous and affected use of words. Those old phrases, "huge pachyderm," "luscious bivalves," "goobers," "canine," have all been pretty well banished. But in the hurry of daily publication there is bound to be laxity. Popular writers are often the worst offenders and those for whom there is least excuse.

A sermon is no place to advertise one's wares, but I cannot resist the opportunity just now to tell you about a new book, *The Newspaper Club,* in which my sister, Miss Evaline Harrington, of West High School, Columbus, and I seek to build a natural approach to the art of writing by using the newspaper as source material for the study of words, grammar, punctuation, sentence structure, story presentation, and the like.

The Newspaper Club is written as a narrative because we believe this is the most natural and dramatic way of holding interest. Everyone loves a story told in conversation by the actors. Do not all books on composition place narration first of the four forms of discourse? Yet most textbooks and some teachers rarely use narration, although it is the easiest to grasp. The story method, however, is not used exclusively. In writing and speaking most persons blend all four forms. In this volume the teacher (dare we call her the heroine?) strives to be a leader of thought, not a retailer of deadening rules and unrelated facts. No pupil is held up to ridicule for his opinion. Every idea honestly advanced by a pupil is welcomed. In some chapters the pupils, not the teacher, swing the discussion. It may be called "a meeting of many minds."

Here is a sample assignment to show how the newspaper may be used to study the rules of grammar and sentence units:

(*Paste and Clip Specimens for Your Scrapbook*)

1. What is the usual sentence structure in the headline?
2. Why are headlines generally declarative sentences and told in the present tense?
3. Examine a news story and mark the sentences, *simple*, *compound* or *complex*.
4. Find examples of nouns to illustrate the definition—the name of a person, place, thing, or feeling.
5. Find four examples of transitive verbs with their direct objects.
6. Find an example of a verb completed by a predicate noun, pronoun, and adjective.
7. Clip a story that has unity and tell how this singleness of thought is secured.
8. How is the headline an example of emphasis? Illustrate by three examples.
9. Find a story which seems to you effectively told, having regard for orderly, clear-cut presentation of facts.
10. What type of sentence did you find the easiest to understand.

I come now to the teacher as an interpreter, expressed in the phrase of the want-ad which suggests that the applicant should know how to relate Bible stories with everyday life. We need just such a happy faculty in every classroom that the lore of the past as imprisoned in textbooks may be loosed from bondage and put into new association with the living present.

In the Medill School of Journalism at Northwestern University we have organized a series of field trips which takes the student into newspapers, magazine shops, and instantly interprets in concrete terms the theories and facts we have tried to develop in the course of assigned reading and formal lecture. Every investigator is called upon to answer a series of questions about each trip and to answer them accurately. Discussion is encouraged around the conference table, and an effort is made to show the practical use of everything encountered on the expedition.

As teachers of journalism, you may not be called upon to connect Bible stories with the day's events—but you may have your share in helping students to see that the storied past is but one chapter in the serial story of mankind, and that this may be found in the newspapers of a generation ago. Read old newspapers and periodicals—the *Spectator Papers* in which Addison and Steele held up the mirror to the follies and caprices of the Eighteenth Century England; read some of the old Colonial papers to see how our forefathers regarded slavery and prohibition before the Revolution; read the chronicles of battle as set down by correspondents who followed the fortunes of armies in the Civil War, the Spanish-American War, the Great War. The newspaper is a social secretary constantly at work painting the portrait of customs, events and peoples, soon to be crowded off the canvas to give place to other actors and other scenes. The newspaper may help you to interpret the past, for it is the great interpreter and teacher as well as the great reporter.

Here are five sample questions to indicate how the newspaper may be linked up with the interpretation of past events:

(1) Rewrite one of the stories of Homer's *Odyssey* in the newspaper style of today. "The Return of Ulysses" and "The Killing of the Suitors" are good examples.

(2) Name five writers eminent in literature, who were once newspaper men (Kipling is one). Write a little news story about each, and his connection with the press.

(3) What is meant by saying that newspaper English keeps the language "fluid" and therefore is good for its growth. Read old newspapers and watch for words that are no longer needed. Give your written opinion of this; it might make an acceptable little editorial.

(4) Appoint a map committee and have the members

make a list of all the places mentioned in the Sunday newspaper, or in three daily editions. Follow these on a globe. Then write a short editorial on "The Newspaper, a Map of the Busy World's Activities."

(5) Clip from the paper a story on local history, such as "News Our Father Read." What is the purpose of this re-printing? Write a little news story founded on the early history of your community.

I have just enough time to point the moral of this little homily on the newspaper as a living textbook, and that is to urge each teacher to encourage her pupils in the production of a newspaper of their own. Many pupils are now collecting and writing school news for special sections of the local dailies, all under the supervision of their managing editor, once known as the teacher of composition.

Every modernized high school publishes a newspaper in which outlet is given for publication of news, editorials, and special articles of outstanding worth. That writing for a newspaper generates interest and incentive there can be little doubt. A medium is furnished for the chronicling of observations, thoughts and opinion, the most prized human possessions. Students learn the value of their work because it is seen and appreciated by their fellows in the form of printed information. The stories are written about people they know and about actual situations and happenings within their own experience.

The spur of other courses may be that of making a passing grade; instead, here is the impulse to write on familiar things, and to share in the daily comradeship of street and town through the medium of the printed page. These reporters look for no greater reward than the expression of joy in their work, for without pleasure there is no profit. The arid plains of their scholastic lives have been irrigated by a constantly renewing interest, namely, the invitation to seek, to find, and finally to write. In the daily performance of our duties, under the watchful eye of a sympathetic instructor, they discover that precept and principle have become living presences.

Every sermon, I am told, should have a peroration to bring it to a satisfying conclusion, and to send the congregation home hungry and sleepy. I have tried to prove that you may have a new assistant in the classroom and in the home library, an assistant always on the job. Every hour of the day, an ungrudging servant furnishes food for thought to countless thousands of readers. His services may be purchased for a few pennies, and he in turn is willing to offer you valuable suggestions on how you may use the contents of his knapsack in making teaching more vital and purposeful, and pupils more intent upon knowing all they can about this fascinating little floating island of the skies.

JUNIOR HIGH-SCHOOL PRINCIPALS

H. H. VALLANCE, *Indianola Junior High School, Columbus,* Presiding

THE TRAINING OF JUNIOR HIGH-SCHOOL TEACHERS OF MATHEMATICS

W. D. REEVE
Teachers College, Columbia University

In the country as a whole the teachers of junior high-school mathematics have made greater progress in solving the problems connected with their curriculum in mathematics than the senior high-school teachers. Several reasons justify such a statement. The majority of the junior high-school teachers are better teachers, perhaps because so many of them were recruited from the ranks of the arithmetic teachers in the elementary school. They understand child psychology better and have had more experience and training along this line. They have not been so hampered by tradition in organizing a course of study for the seventh, eighth, and ninth grades. This has enabled them to be more experimental in their methods of discovering the best material to include in each grade. Again, they do not have to prepare their pupils to meet extramural examinations and hence are not obliged to point all of their work toward one final test, and so become formal in their methods.

The result of the combined efforts of all those interested in the teaching of junior high-school mathematics has had a salutory effect. Today, a rather wide agreement exists concerning the general features of the course in junior high-school mathematics, even though the order of treatment of topics is not standardized as it has been in the senior high school.

It is quite generally agreed that the course in mathematics in the junior high school should be determined by the general purpose we have in mind, namely, to produce well-educated citizens. This is different from the purpose a few years ago when the main aim was to prepare pupils for college.

This difference in purpose makes possible a difference in content. It permits us to open the door of mathematics to every boy and girl and to give a broad view of the subject in order that each one may choose according to his ability and preference after seeing the general nature of the subject and the meaning of the science. If his tastes and needs require it, the pupil should be permitted and encouraged to go on.

Because of the wide range of individual differences in native ability, experiences, and interests, we need to keep in mind the guiding principle in the selection of subject-matter for each grade. This principle states that the subject-matter selected for each grade should be that material which will be most valuable to the pupil provided he leaves school at the end of that year.

In the seventh grade, the first year of the junior high school, the aim is to keep up a proper use of the fundamental skills in arithmetic which the pupil has learned in the first six grades. This is done by giving such applications in the arithmetic of the home, the store, the bank, thrift, and the like, as the well-educated citizen is likely to need. In addition, the pupil is introduced to the study of intuitive geometry, a subject in which he looks at a figure and draws certain conclusions. For example, he looks at an isosceles triangle and says "the base angles are equal" because he cannot conceive that they might be otherwise. In other words, "he feels it in his bones."

Three questions in geometry may be asked about an object: "Where is it?" "What is its shape?" "What is its size?" The answers to these questions give rise to the geometry of position, form, and size. These topics should be treated to give the pupil some idea of geometric forms in nature, architecture, and design.

In the eighth grade one-half of his time is given to a further consideration of the fundamental applications of arithmetic such as problems of trade, banking, insurance, and corporations. The other half of the year is given to a study of algebra because to begin the algebra here and finish it in the ninth year is better than to condense the work in the ninth grade.

If a pupil ever uses algebra, his greatest need will be a knowledge of the formula. In this he conceives his idea of the meaning of algebra. Even if he doesn't use formulas, he must read with them. And so it is with the statistical and mathematical graph. If he uses formulas at all, he will need to know how to solve the simpler types of equations. To these we may add directed numbers as portions in algebra which the well-educated citizen should know.

In the ninth grade, the course in elementary algebra should be completed and a unit of numerical trigonometry given. This can easily be done because the trigonometry is based on intuitive geometry and the pupil's previous knowledge of algebra. Moreover, there is today a clearer conception of the nature of trigonometry and its relation to modern life. It gives the pupil a knowledge of indirect measurement in contrast to direct measurement where the measuring instrument is laid directly on the distance to be measured. It can be made so simple as to be much easier than many of the traditional algebraic topics, it is far more interesting to the pupils.

At the end of the year a short unit of demonstrative geometry should be given so that the pupil will have a chance to find out what it means to actually prove something. This can be done with a few axioms, postulates, and theorems reinforced by some carefully planned work on original exercises.

It is clear that the junior high-school course briefly described above is general mathematics in the best sense. With this basis it is possible in the tenth, eleventh, and twelfth years to give a glimpse into the more advanced parts of geometry, trigonometry, algebra, analytic geometry, and the calculus to those pupils who are able and interested in receiving it. I have mentioned all the various departments of the field of mathematics in some detail because I want to emphasize at this time the importance of being well-grounded in subject-matter.

A reasonable and a desirable requirement which ought to be met by everyone desiring to teach mathematics in the junior high school would be just such a course as I have described above culminating in the calculus. Of course, no one will teach calculus in the junior high school, but he will teach the other material better if he knows what lies ahead. In other words, a teacher should know his subject as thoroughly as possible in order to have the proper background for his work. This is the first step in his preparation. In no other way can he be qualified to determine valid objectives.

In the second place, the teacher of junior high-school mathematics should be trained in methods of teaching. This involves a knowledge of the various types of lessons, lesson planning, the art of questioning, and the like. It is clear that with all the success which teachers in the junior high school have had, there is still room for improvement in methods. We also need to learn more about the experimental methods in our teaching.

Coordinate with methods of teaching are methods of learning. Few teachers, if any, know much about how children learn. In fact, we are just beginning to understand a few of the fundamental things about the psychology of learning. We need to know more about how a child learns most easily and economically. One reason for the present low mastery in mathematics is the fact that teachers do not know how long it takes a child to learn. Moreover, we are in disagreement often about the best methods of presenting various topics.

In the next place, teachers should be encouraged to attend regularly the association of mathematics teachers to which they rightfully belong, to read the mathematics journals and yearbooks, and, occasionally, to spend a few weeks in college to strengthen and renew their interest in mathematics. Nothing is more important today in the improvement of the curriculum than the training of teachers in service. It is sheer folly to spend a great deal of time re-organizing the curriculum unless the teachers of mathematics at the same time keep pace with the changes that are being made around them.

Implicit in all that I have said is the great need for better organization and understanding among mathematics teachers as a group. The junior high-school teachers occupy an enviable position between the teachers of elementary arithmetic on the one hand, and the senior high-school teachers on the other. Each group needs to know what the other group is doing. Today this is not the case—too much apathy and neglect of these important connections exists. Finally, there is need for wise and adequate supervision. Someone ought to discover what a supervisor does when he supervises. We have had a great deal of discussion recently about supervising, but very little real supervising is done. We need to spend less time in finding out where the lockers or the drinking-fountain ought to be placed, and more in improving instruction. It is only by the cooperation of all concerned, from the superintendent of schools down to the classroom teacher that we may expect to achieve the great aim of the American public-school system.

CRITERIA FOR JUDGING THE EFFICIENCY OF A JUNIOR HIGH SCHOOL

James M. Glass
Winter Park, Florida

The junior high-school movement is a tangent diverging from established practices. It was created to achieve new purposes. It began without a pattern or fixed standard. Its only guide has been experience.

To the literal-minded it grows irksome because it cannot be standardized. Its chief virtue of continuous experimentation becomes a fault to those who would objectively measure it. Steadfastly it refuses to stay put. For a decade and a half we have experimented, accepted, amended, and rejected. Repeatedly we have adopted criteria for judging its efficiency and then proceeded to modify or discard them.

We could not do otherwise and be scientific, and to fail to be scientific in this age of research and investigation would be an anathema to the best educational thought of our day. The absence of definitely established standards is evidence only of an incessant discontent from which comes greater efficiency.

Until we complete an experiment in the laboratory we cannot draw conclusions. The purpose of experiment is to postpone conclusion until the experiment is finished. During the process of experiment we watch the steps of its development, make observations, record data, and test conclusions.

Who has not watched height lines crawl up the casing of a convenient door? We perpetuate the custom with our children. The junior high school is growing, but it has not grown to its full stature. We can measure its growth and fix the lines of its present achievements, but we would no more curb the carrying forward of its experiment than we would check the growth of our children.

This paper, therefore, is undertaken in the conviction that criteria for judging the efficiency of a junior high school can be tentative only. They are unavoidable, however, and for no other reason than that they are needed to help clarify the lessons of our experience. We cannot improve and restate our criteria without first testing them.

Everywhere one meets the question, How can we judge the worth of our junior high school? Experience alone will provide the answer. Let us put our subject this way: What are the generally prevailing practices which can be used as criteria for judging the efficiency of a junior high school?

The first criterion by which a junior high school should be judged is the vision of its administrators and instructors. Junior high schools vary little in organization, program of studies, and administration. They do vary, however, in the breadth of vision of their faculties. Principals and teachers need unceasingly to search for the underlying philosophy of the junior high school, for the irresistible fascination of its true spirit, and for the enthusiasm which rewards this search.

The teacher attempts to create a transition school designed to articulate elementary and secondary education into one continuous and integrated school system of eleven or twelve years. Experience brings the conviction that the junior high school should begin by continuing elementary materials and methods. It should then carry forward its own mission in the school system by fusing elementary and secondary procedure into new and composite products adaptable to its own needs. Finally, it should close by initiating secondary materials and methods to assure proper articulation between itself and the senior high school. Thus will preparatory study and actual experience interpret the mission of the junior high school to the growing vision of a faculty. With this vision to guide experiment and to inspire service, the junior high school becomes a purposeful and dynamic center of educational reconstruction. The first criterion—a faculty with vision—is the cause of which an efficient junior high school is the result.

The acid test of any school unit is the degree of correspondence between the psychology of the age with which it deals and its organized environment of materials, method, and school life. This criterion leads to the conviction that the junior high school is an agency to make the study of psychology the basic principle of secondary education. The child, rather than subject-matter, must be the focus of procedure.

Fortunately, many junior high-school teachers have been trained in the elementary and primary school. Here they have learned that the study of child psychology accounts almost entirely for the increased efficiency of the elementary schools because of which it has released its last two years to the secondary school. These teachers have carried over into the junior high school their experience of making psychology the basis of their method. Under intelligent leadership they will become thorough students and practical exponents of the principles underlying early adolescent psychology.

Like the junior high school itself, early adolescence is a period of gradual transition from the age of childhood in the elementary school, through the age of pubescence in the junior high school, into the mid-adolescence of the senior high school and to late adolescence of higher education and early vocational life. There is, therefore, a psychological correspondence between the age of transition and the school of transition.

Early adolescence is a gradual awakening, an irrestible desire for wider contacts, the forward look, and a broader vision. Accordingly, the efficient junior high school offers in its building, equipment, curriculum, and its organized environment richer facilities which harmonize with these expanding instincts.

Early adolescence is an age of budding independence in intellectual activity, of instinctive trying-out of new powers, a sampling of varied activities to discover wherein proficiency may be found. The early adolescent is impatient of review in old educational materials. He has no concern for details. The simpler aspects of each new study content his present cravings. Refinements come later. The efficiency of a junior high school is to a large degree determined by the harmony between these instincts and its curriculum construction and classroom procedure. The second criterion —building a junior high school upon the foundation of early adolescent psychology—gives assurance that it will pass the acid test of its efficiency, a fundamental correspondence between the early adolescent age and the early adolescent school.

Reconstructed program of studies in a junior high school means, in brief, a change from a vertical line of demarcation between elementary and secondary courses of study, which produced the gap in the 8-4 plan, to a diagonal line of gradual articulation between them, which will integrate a 6-3-3 or 6-6 plan into a continuous school system.

Each course should proceed by natural, transitional, and progressive stages from its elementary to its secondary constituents; should fuse the refinements of allied elementary courses with the simpler aspects of allied secondary courses; and should provide a survey of the subject field to the end of exploring aptitudes and revealing its educational and vocational possibilities. The materials of each course should deal with the problems, interests, and needs of the early adolescent age.

The so-called junior high schools, so frequently discredited in the early years of the movement, failed chiefly to replace the exclusively elementary courses of their first two years and the exclusively secondary courses of their last year with the general courses characteristic of efficient junior high schools of today. The present widespread curriculum study, research, and experiment are evidence of an increasing appreciation of the vital need for reconstructed courses of study.

Invariably, the approach in a present-day project to adopt the junior high school is the program of studies. There has been a time when the initial approach too frequently was the mere reorganization of the three grades into a new administrative unit under the name of a junior high school. This third criterion of a reconstructed program of studies is steadily becoming the actual enacting clause which makes effective a junior high school in fact as well as in name.

The exclusively cultural-disciplinary concept of education has been modified, not replaced, by a modern social-practical concept. This new concept leads to the conviction that the socialization of the curriculum is a paradox without the socialization of classroom procedure. Manifestly, then, a fourth criterion for judging the efficiency of a junior high school is participation in the widespread experiment of socialized classroom procedure. This fourth criterion assures a modern and consistent program for an efficient junior high school, namely, an objective to introduce new social-practical values, the reconstruction of materials to socialize the curriculum, and socialized classroom procedure to harmonize method with objective and materials.

A more comprehensive and sympathetic understanding of early adolescent psychology will save junior high-school teachers from fatal errors in classroom method. Adolescence is characterized by a dynamic mental growth from the vicarious thinking life to the independent thinking life. Youth has an irrepressible instinct to think, to inquire, and to investigate for himself. He wants to discover and to understand in terms of his own experience, yet his power for independent thinking and study has not developed to the point where he can do so unguided.

The faculty members of an efficient junior high school are the unobtrusive directors of mental expansion. They accept the concept of the classroom as a laboratory even though it challenges their former practice of making it a recitation room. They subscribe to the principle of "activity as the chief means of learning," though they are themselves unable at all times to apply it. They believe in learning by doing because they themselves are being trained to efficiency during the process of doing new things. They are willing to experiment with directed learning, socialized classroom procedure, and other expressions of the ideal because their classrooms compose in part the laboratory in which the junior high-school experiment is being conducted.

This fourth criterion obviously requires the adoption of the longer period. The laboratory needs more time than the recitation. Likewise, socialized classroom procedure, which is a laboratory method, is impracticable under traditional recitation limitations of forty-five minute periods. Consequently, the fourth criterion leads to the practice of administering an efficient junior high school on the basis of six one-hour daily periods or an approximate equivalent.

Guidance is a synonym for the junior high school. It must guide its pupils from the common and single curriculum of the elementary school, through its own enriched program of studies for testing aptitudes and revealing educational training, to the proper curriculum placement of its individual pupils among the multiple curricula of the senior high school. This individualization of junior high-school instruction and administration is peculiarly a guidance problem.

The guidance program has three objectives, first, the discovery of individual aptitudes; second, the discovery of educational opportunities for the training of aptitudes when revealed; and, third, the discovery of vocational openings for the useful employment of aptitudes when revealed and trained. The junior high school offers to the early adolescent youth, as he instinctively looks forward to his proper place in society, three visions: his own native endowment, the world of education, and the world of work.

The efficient junior high school subscribes to the practice of classroom guidance instruction. It is convinced that junior high-school children with their impulses to mental self-activity should have their own conscious interpretation of what the junior high school has planned to give them, what they are to achieve for themselves during its three years, and how they are to succeed in their efforts to reach these goals. Further, they must know the worlds of education and vocation if they are to find an intelligent adjustment to both during the periods of training and vocational life. The efficient junior high school, therefore, believes in a guidance course of study as an integral part of the program of studies and in the guidance classroom period as an integral part of the schedule of classes.

This fifth criterion leads still farther to the vocational counselor, the girls' adviser, the boys' adviser, the home-room weekly period, and to other types of social and personal guidance as varied as junior high schools themselves. Experience is teaching us all that the junior high-school teacher is primarily a guide of early adolescent youth and secondarily a teacher of subject-matter. Our fifth criterion teaches us that guidance is not only a synonym of the junior high school but also its basic method. By the efficiency with which the guidance program is administered can we judge the worth of a junior high school.

A sixth criterion for the appraisal of a junior high school is its program of citizenship, more commonly called extra-curricular activities. Dewey's definition of the "school as life, not preparation for life" is interpreted by Kilpatrick in his concept of education as "the continuous remaking of the child's life upon ever richer and higher levels." Thus defined, the junior high school is the early adolescent cross-section of life, a higher level than the elementary school and antecedent to the richer experience of the senior high school. It is, as Henry Neumann states it, "the special field for their activities" as junior citizens.

The socialized curriculum, classroom procedure, and school life constitute a harmonious whole because they complement each other. The materials of the classroom, the method of instruction and learning, and the citizenship activities of the early adolescent school consistently work together toward the goal of all education—the citizen serving society.

Early adolescence is an age of general expansion: a physical expansion with its instinct for ceaseless activity; a mental expansion with its instinct for rationalized understanding and its aversion to mechanized practice; a social expansion with its instinct for cooperative service; and an emotional expansion with its instinct for altruistic expression. All of these worthy instincts are converted into useful and saving habits of conduct through the program of junior citizenship.

A competent junior high-school faculty knows that junior citizenship requires the unremitting and sympathetic control of those who understand and love boys and girls of this age. They know that they must be the same unobstrusive directors of the citizenship activities of their homerooms as they are of the directed learning of their classrooms. They have become convinced that junior citizenship is extracurricularizing the regular activities of the classroom. They, therefore, accept without hesitation their assignments as homeroom counselors, club sponsors, and coworkers in citizenship activities. Their experience in the school life outside the classroom increases their powers more effectively to perform their duties in the classroom. They cannot comprehend how any junior high school can be appraised as efficient without the program of active, living, and inspiring junior citizenship.

Building criteria by which to appraise a junior high school should include a library which is the general laboratory of all classrooms; a gymnasium where new physical powers may be properly trained; health rooms where unfortunate physical handicaps may be remedied before they become permanent; practical art shops for girls and boys where both may be trained to worthy home membership; fine-arts rooms where instincts for the appreciation of the aesthetic may find expression; no study halls to invite wrong habits of undirected learning; the laboratory ideal for every classroom where the principle of activity as the chief means of learning finds a stimulating environment; a students' conference room where leadership in junior citizenship may be trained; and ample administrative and supervisory quarters where the principal and advisory and supervisory associates may function effectively.

Prior to the architect's preparation of plans there should be drawn up a set of educational specifications which will control the architect as his specifications control the contractor. These specifications amount to the visualized operation of the actual school within the building. They specify the type, size, and number of classrooms, the size and equipment of library, gymnasium, auditorium, shops, laboratories, home-economics rooms, music and art rooms, office quarters, and accessory facilities which are not likely to be included unless the educational architect specifies them.

Without competent educational specifications the operation and efficiency of the school organization will be handicapped by unfortunate and unnecessary restrictions of construction. Such instructions are indispensable if a junior high-school building is to be determined by the organization of the school to be operated within its walls.

The day of the educational architect is at hand. His cooperation will be received with enthusiastic welcome by the building architect. The services of both tend toward a unified educational-building program which guarantees that the physical plant will measure up to the criteria of efficiency.

A final criterion for judging the efficiency of a junior high school is its freedom to continue experimentation and its privileges to challenge inhibitive traditions. It is the pivotal center of educational reconstruction. It dares to make mistakes that it may make progress. Standardization is protested until problems are solved and as long afterwards as possible. It must not be circumscribed by conventional practices which impede the experiment to increase its efficiency.

Progress has been made, but the mission only partly fulfilled. Conditions in any junior high school cannot become rigidly fixed without limiting growth toward greater effectiveness. The efficient junior high school will endeavor to stay in a plastic state of progressive development. Experiment, research, investigation, discussion, and unremitting study are its media of increasing efficiency.

The final criterion of continued experimentation leaves us with what we started—tentative standards of measurement. The creative inspiration of the junior high-school movement is to raise higher and higher the criteria for judging its own efficiency.

THE SUPERVISION THAT TEACHERS NEED

Arthur F. Seybold
Principal, Thomas Jefferson Junior High School, Cleveland

The last two years I have been attempting to deviate from the program of generalities usually considered in any scheme of supervision. I do not feel that I have solved the problem confronting the supervisor, but I have three hypotheses which I submit as factors in the solution. We should have more faith in the abilities of our present teaching staff. We should create a science for the discovery and the development of creative teaching. Finally, we should perfect a plan of educational guidance in specific projects which will permit and which will provide professional growth toward a true philosophy of education.

The most important need for adequate supervision is faith in the classroom teacher. We have spent too much time in attempting to find out what was wrong. We have not begun with the assumption that most of our teachers are professional in spirit, that they are guided by objectives vital as life itself, and that they have a desire to teach better as the years pass. A stage of development has been reached when most teachers are professional, are broad-minded, and are eager to give efficient instruction in class-rooms.

What most of our teachers need is not criticism, but recognition. We have accented the method and the philosophy of education in past years and have raised these aspects of education to higher planes. Have we searched for the real essence of the fine art of teaching? Have we become skilled in looking for good qualities? We must discover the spark of creative achievement and then give it adequate expression. When we have fashioned a science in the discovery and the cultivation of the creative instinct in teaching, we shall make rapid progress in the field of supervision.

The primary problem of supervision is, then, the discovery of hidden powers locked within the personality of the teacher. The improvement of teaching, which is the end sought, is most easily obtained through educational guidance in specific tasks in which teachers, pupils, and supervising principals participate. More skillful teaching, a better methodology of instruction, and a true philosophy of education are the results of this cooperative work. The supervisor who has faith in the abilities and aspirations of his staff, who can discover the hidden powers locked within the personalities of his co-workers, and who can inspire professional projects, will provide the supervision which teachers need.

DISCUSSION

L. N. DRAKE
Pilgrim Junior High School, Columbus

The early history of the formation of the junior high school is somewhat hazy. To the best of our information, however, the first school in the country given the name of junior high school was organized in September, 1909, at Indianola School, Columbus, Ohio, with C. H. Fullerton as

Principal. Admittedly the primary object was to relieve crowded conditions in a high school by retaining the ninth grade at the elementary building. The experience of that year and the faith and vision of Mr. Kinkead, elementary supervisor of the city, were the primary causes for the establishment, in September, 1910, of four junior high schools formed by adding ninth grades to established elementary schools, with departmental work in the last three years.

Since that time, Columbus has enlarged and refined the junior high-school organization into a city-wide project, which at present embraces thirteen junior high schools. As a result, Columbus has come to stand in the educational world for certain policies and principles of administration and organization in the junior high-school field. These coincide rather closely with the eight criteria presented by Dr. Glass. Limitations in Columbus, however, as elsewhere, cause much to be desired before an ideal efficiency can be attained.

In this day of tests and measurements and scientific education many of us have come to the conclusion that the most important phase of the use of such criteria is the remedial action to follow. The criteria presented by Dr. Glass should suggest how boards of education and administrators may use them in the improvement of present conditions.

One phase that might be improved, in addition to "A Reconstructed Program of Studies," is reconstructed subject-matter. I take an illustration from a paper presented to the Mathematics Section at the 1927 meeting in Dallas, Texas, of the National Educational Association by Miss Marie Gugle:

> The old curriculum, in which arithmetic was completed in the eighth grade, and algebra as a new and non-related branch was taken in the ninth grade, followed by geometry and trigonometry, may be likened to a chain of disconnected links. These links remain separate and of little use except for the comparative few who continued the study of mathematics, particularly applied mathematics in college. Then and not till then did any of the pupils see any purpose to it all. The early parts of the course were mere fragments and, because they were fragments, they were meaningless and useless.

> A course in the newer mathematics may be likened to a large circle, made up of different phases of mathematics as sectors not separated, but unified into one whole circle. In the junior high school, the pupil surveys a limited portion around the center of this circle. But, because the field is complete as far as he goes and is not fragmentary, it has a meaning and significance not otherwise possible.
>
> In the senior high school, the explored part is extended, but it is still a complete circle. The diagram, or illustration, becomes, therefore, not disconnected links, but a series of concentric, ever-widening circles, each meaningful and useful.
>
> If a large picture is broken into fragments and one sees one small piece, one has no idea of the meaning or beauty of the picture. However, if the small piece is not a fragment, but is a reproduction of the entire canvas in miniature, one knows something of the original composition and has an appreciation of its beauty.

Unless a pupil in the junior high school has an opportunity during his academic courses, to explore a little of the *entire* field of the various subjects, he is being deprived of his right to discover his interests and aptitudes in an important sphere of education.

Miss Gugle has used this guiding principle in producing the *Modern Junior Mathematics* series. By introducing in other subjects reconstructed subject-matter similar to mathematics many advantages could be gained.

Columbus has not yet adopted the six one-hour period plan, preferring to provide for numerous exploratory courses, extra-curricular activities, library opportunities, and greater range of election of courses. However, the need of closer guidance of study habits, the danger of too greatly shortened expression of interesting subject-matter and the certainty of better results tend definitely to its more general adoption. The primary reason for failure to adopt this plan is administrative.

The reduction of the number of periods per week of certain subjects, the improvement of schedule-making, the possible reduction of the number of majors in the eighth grade to the same as the seventh and ninth grades and the use of reconstructed subject-matter would greatly lessen these administrative difficulties.

Guidance has made itself a highly significant term in recent educational thought and particularly so in the junior high school where it has become the paramount function. While guidance is too complex a term to be resolved definitely into its elements, yet, in order to show its complexity, importance, and scope, at least seven phases are evident—physical, curricular, social, vocational, civic, avocational, and ethical. Since these phases parallel the seven cardinal objectives[1] of secondary education, they are a natural and logical basis for approach.

Some schools are side stepping the guidance program through fear of error instead of sympathetically and scientifically attacking the problem. The words of Dr. Glass that the junior high school "dares to make mistakes that it may make progress" would challenge us to attack the problem more vigorously from all phases instead of the narrow vocational sense in which it has been interpreted too often.

The papers of this afternoon represent a wealth of knowledge and a world of experience. They provide a worthy challenge for further discussion.

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[1] Health, command of fundamental processes, worthy home membership, vocation, citizenship, avocation, ethical character.

KINDERGARTEN AND PRIMARY TEACHERS

RUTH STREITZ, *University of Cincinnati*, Presiding

THE SIGNIFICANT CONTRIBUTION OF THE NURSERY SCHOOL TO THE KINDERGARTEN

MAY HILL

Principal, Cleveland Kindergarten-Primary Training School

The nursery-school movement has grown in this country with astonishing rapidity. This is due, in part, to the fact that it has been the center of research for home economics, kindergarten, nursing, medicine, and psychology. Because of the combined efforts of specialists from these various fields, this new movement has made some definite contributions to the education of early childhood by which the kindergarten-primary may well profit.

The first outstanding contribution is success in establishing right physical habits in nursery-school children. There are no sermons about cleanliness nor distorted versions of Mother Goose rhymes about spinach. Health habits are established through practice, not through precept. Food antipathies are overcome and liking for right foods developed. Eating, elimination, and sleeping are matters of daily study and record-keeping in the nursery school. The habit of vigorous, daily out-of-door play is established by providing an out-of-door environment rich in play possibilities and then allowing time and freedom for play.

The nursery school is also stressing the importance of establishing right emotional habits in the years of early childhood. Fears, jealousy, and all such undesirable emotions must be prevented. Habitual bouyancy, cheerfulness, and emotional stability must be cultivated. When a child shows unfortunate emotional conditioning he presents a problem that must be solved. Sometimes the solution involves a complete case study with the help of the medical examiner, the psychologist, the psychiatrist, and other specialists—a nursery school with an adequate staff is prepared to give this service. Moreover, it considers the solving of behavior problems, and the restoring of emotional balance which is more important at the nursery-school period than at any other time during the curriculum.

The third important emphasis of the nursery school is the forming of acceptable social-moral habits. The kindergarten has always practiced its children in habits of orderliness, perseverance, courtesy, and fair play. Oddly enough, however, the kindergarten has been in danger of underrating its success in this field because of the pressure from above for a richer curriculum. Kindergarten children must learn four ways of skipping, ten Mother Goose rhymes, six spring birds, and something of community life. In the pressure of these achievements the parallel development of right habits and attitudes was in danger of being overlooked. Now the nursery school, with its simplified curriculum, reminds the kindergarten that, in the interest of necessary skills and facts, it must not cease to be proud of its continued success in forming desirable social and moral habits in its children.

The last contribution of the nursery school that time permits me to stress is the critical attitude of American-trained nursery-school teachers toward their work. They reflect the modern emphasis on experimentation and research. The American-trained teacher continually challenges nursery-school procedure. She scrutinizes and tests her materials and equipment. She is looking for objective evidence to support her methods. She sees the child's needs as a daily challenge to research. She demands the right to experiment. She asks for the scientific studies of experts on which to base her work. This is the attitude of the scientist. It is a conspicuous characteristic of our well-trained American nursery-school workers. It is an attitude that we need throughout education.

CHILD NEEDS: AN IMPETUS TO RESEARCH

LAURA ZIRBES
Lecturer in Elementary Education, Teachers College, Columbia University

All about us we see evidences of increased interest in the young child and evidences of increased activities in research in the welfare, development, care, and education of the child. Such evidences need only be mentioned to be recognized as signs of the times in which we are privileged to work. The following are a few of the signs of general interest in children with whom we, as nursery-school, kindergarten, and primary-grade teachers are engaged in our professional work: a new magazine called *Children* devoted to the popularization of scientific knowledge about childhood; new research institutes and centers specifically endowed for the study of children and the professional training of teachers, and child welfare workers; conferences, study groups, and meetings organized to discuss the problems of child psychology and child nurture; books and leaflets reporting the outcomes of researches referring to the pre-school child's interests and capacities; new courses in psychology; and fields of professional opportunity opened by the demand for trained child specialists investigating nutrition, mental hygiene, and education.

Whence comes this new interest? The scientific worker has discovered the child as a field of research and has been spurred by the fruitlessness of work with young children. The social worker has realized that the roots of many social problems can be traced back to childhood influences. Those in medicine have also realized the possibilities of the right start and economy of preventive measures, while constructive health programs have made these considerations paramount. Child needs have challenged research and research in turn has served child needs.

In what respects has research served the needs of the young child? It has reduced infant mortality and controlled many of the scourges which have blighted childhood and have left their traces through maturity. It has given us norms of physical growth and development by means of which we can study cases and groups comparatively and a wealth of information about vitamines and diet combinations which are adjusted to specific child needs. Thus do our children profit by the results of research.

Our work is facilitated and dignified by the application of science. If our professional service is to become more expert, however, we must not only apply the outcomes of research increasingly but also contribute to the progress of research in definite ways.

The classroom is an excellent laboratory for assembling data on child needs. The McCallie Vision Test for Illiterates, which any teacher can give, is like a game. It can be used for successive individuals in a group without giving the last ones tested the advantage of practice and without requiring provision for other activities while the teacher is testing. With this test, the teacher can discover which pupils in her kindergarten or primary group have seriously defective vision. She cannot correct this defect but she can report it and adjust the pupils' school régime and seating in terms of it. Records can be kept of individuals who have particular difficulties or disabilities which may be due to visual defects. Certain types of school materials or activities which seem particularly suited to such cases may be tried. Child needs thus become an impetus to research through the agency of the classroom teacher.

We hear a great deal about large-muscle activities for young children—a great deal of general talk and not much specific suggestion. Progressive teachers are becoming increasingly critical of kindergarten activities which keep children confined to their chairs and require cramped positions, fine muscular adjustments, and close eye-work. The research on appropriate play materials and school equipment for young children would receive an impetus from careful classroom records and comparisons of the pupil's activities and from the experimental use of unconventional play materials which are suggested by the child's use of his environment. A pair of five-year-old twins on a subway in New York played with the steel piping in ways which suggested the "jungle gym" now so popular with young children. Is that how the jungle gym came to be? It certainly suggests an approach to the development of new play materials. The teacher who knows the classroom needs could contribute to research by proposing and trying out new play materials, reporting on pupil responses, and inviting the cooperation and judgment of psychologists and research workers.

How did easels come into the classroom? How did the large hollow blocks of the city and country school come into being? Why are sewing cards and bead stringing given less time and place in the progressive kindergarten? Why do so many primary classrooms have work benches? Why do so many primary classes have live pets for at least part of the school year? Some one ventured into the untried and unknown to serve a child need. Who knows how many more improvements of this sort may be made when the classroom teacher realizes the challenge of child needs and responds with a research spirit?

The first report of progress on an extended study was published in *Childhood Education* for January, 1927. The International Kindergarten Union is sponsoring an investigation of readiness for reading. This study illustrates the possibilities of cooperative research in the investigation and service of child needs. Teachers and administrators have been troubled by the great number of reading failures in the first grade. Philosophers, on the one hand, insist that instruction in reading should be postponed because so many first-grade pupils experience difficulty and failure. On the other hand, those more or less uninformed on the legitimate objectives of the kindergarten, and unconvinced of its contribution to childhood education, propose that instruction in reading begin earlier, thus giving two years of reading before promotion to the second grade. Kindergarten workers and teachers who have come face to face with the actual nature of pupil difficulties in their classes maintain that this is not a desirable thing to do. Scientific workers interest themselves in the investigation of beginning reading. Specialists in the psychology of learning propose that the failures may merely indicate that the materials and methods of reading do not meet the child at his own level and they set up experimental approaches which are intended to test this solution. This general interest culminated in the investigation by the International Kindergarten Union. The study is being conducted by a committee composed of a laboratory psychologist, a reading investigator interested in the improvement of practice, a director of kindergarten primary work in a city-school system, and a classroom teacher. The committee began its work by enlisting the cooperation of hundreds of teachers in an analysis of causes of failure and based its intensive experimental program on the summarized results of the responses to a questionnaire. This illustration is an excellent example of the possibilities of cooperative research in the service of child needs.

Cooperation of another sort is developed in another approach to the reduction of failure and the better adjustment of the school to individual needs of problem cases. I refer to the clinical approach to case studies. Diagnostic and remedial work in behavior cases and in problems of school progress not only helps the individual or case, but throws the light of cooperative inquiry into the regions where educational adjustment is necessary. By bringing such cases to the attention of child-welfare clinics or similar agencies, the teacher secures the service and advice of specialists, and the case is adjusted.

Recently an unpublished study of pupil difficulties in word recognition came to my hands. It was conducted by a research worker who had never taught children. It had certain weak points which showed the need of primary teachers' insight and lack of knowledge of the classroom learning situations. This study cited four or five previous studies by persons of international reputation and criticized each for the very lack which it embodied. Not one of these research workers had had the background of actual classroom teaching responsibility. That explains the type of research which does not arise from child needs nor finds its service in them. There is too often a gap between the trained research worker and the classroom teacher, a lack of common experiences, a lack of contacts, and mutual understanding which prevents that interchange of ideas upon which progress depends.

As long as teachers consider research a special function in which they have no responsibility, persons without critical judgment on classroom needs and possibilities will assume that critical judgment does not exist and will arrogate to themselves privileges for which their training alone does not fit them. If the classroom teacher does not undertake such practical studies herself she should at least assume the rôle of interested practitioner and pass upon the effectiveness of research findings or contribute to the plans for projected research by a careful critical study and report. Group judgment of experimental materials should be a serious responsibility of scientifically minded teachers. The leadership in such groups should set up impersonal bases of judgment, gather responses, tabulate them, and report to research agencies, organizations, and periodicals.

As teachers, we have a responsibility which cannot be evaded if we wish to be considered professionally minded. In this connection I cannot refrain from suggesting that the future of research in kindergarten-primary fields awaits the emergence of a selected group of experienced teachers trained to their calling but imbued with the spirit of inquiry and convinced that child needs will be served better tomorrow if they devote themselves to advanced studies for a time and then act as research advisers and consultants, teachers of teachers, whose problems they know from first-hand contacts. One such person in Washington, a graduate of a normal school with two successful years of experience and a few college courses to her credit, is now assembling research problems in her classroom and has organized a program of studies which will put her in a position to solve them. She expects to spend alternate years teaching and studying until she completes her studies for the Doctor's degree and will then devote herself to research in the field. That is one case—others could be cited. Young successful teachers with scientific inclinations should be encouraged. There are, however, many who will continue in the classroom by preference or by circumstance. They will deal with child needs. They will often be confronted with problems for which experience offers no satisfactory solution. They may see in such child needs, perhaps, an impetus to research and a spur to study. They will also have an incentive to take their problems to a professional school or a research center and to use them as the basis of professional readings, study, and investigation, as a means of finding the solutions and achieving the satisfactions which such work brings and and the advancement which it deserves.

I am thinking of two university classes, one in Ohio and another in New York. In these classes teachers in service are using actual child needs as topics for special investigations. Reports of some of these will find their way into use and publication. I am thinking of two other investigations in which a number of teachers are cooperating. The object of one is to translate the expression, "activity leading to further activity," into an array of concrete, activity sequences which have occurred and are likely to occur in kindergarten-primary classrooms. The other study is to read similar concreteness into the term, "purposeful reading." Can you think of any other philosophical stereotypes or general proposals which are in need of practical illustrations? Can you see any reason for leaving these matters in the realm of vague generalizations when classroom teachers could readily contribute to their clarity and use?

Among the five hundred problems gathered from teachers in several states there are surely many which are yours. Many of them will lead to investigation by advanced students. Some will eventuate in contributions which will serve child needs. Surely I have indicated, among all these ways, some capacity in which you, as teachers, may serve. I sincerely hope that I have imbued you with the lure and joy of service which meets such needs by the discovery of new values and the contribution of tested knowledge to the profession of teaching, thus indirectly, but none the less truly, contributing to the enrichment of child life and the enhancement of educational opportunities.

THE IMPORTANCE OF THE KINDERGARTEN TO THE WORK OF THE ELEMENTARY SCHOOL

JOSEPHINE H. MACLATCHY
Ohio State University

An attempt was made by the Bureau of Educational Research at this University to define the importance of the training received in kindergarten in terms of achievement in the first grade. The progress of the pupils who entered Grade I in eight cities of Ohio in September, 1923, was carefully recorded; and their achievement was measured by standardized tests. These first-grade pupils, for the purpose of this comparison, were classified into two groups, the K and the N-K. In the K Group were included those children who had attended kindergarten; in the N-K Group, those who had not.

Certain ratings of activities which were thought to be influenced by kindergarten training were obtained from the first-grade teachers at the end of the first year. These were oral language, industry, and initiative. In Table I the portions of the 1,155 kindergarten children receiving the ratings of good, average, or poor in the oral-language work of the first grade were recorded. The members of the K Group were characterized by more good and less poor ratings than were the 1,009 of their classmates who had not attended kindergarten.

As far as possible, every kindergarten child was paired with a non-kindergarten child who received a similar rating in intelligence. The percents for the paired pupils of each group were computed, and the distribution when determined closely resembled that of the members of the total K and N-K Groups (see Table I).

In one city in which the early grades were organized according to a unified kindergarten-primary program, the 31 pupils who had not attended kindergarten were paired with 31 kindergarten children of similar intelligence scores. The percents, because they were computed for such a small number, cannot be seriously considered, but may be thought indicative of the conditions which might be found if sufficiently large numbers were concerned. The percents of good and fair ratings for both groups were higher than in either of the previous comparisons; and the differences between the two groups in the three ratings were considerably lessened.

Because of the lack of space, the teachers' ratings for industry and initiative were not included. The results were similar: the children who had attended kindergarten had more good and fewer poor ratings, indicating in these three social ratings a decided advantage for the members of the K Group.

TABLE I
PERCENTAGES OF PUPILS RECEIVING TEACHERS' RATING IN ORAL LANGUAGE

	Good	Average	Poor
(1)	(2)	(3)	(4)
	Whole Group		
K Group....	28	52	20
N-K Group..	15	52	33
	Paired Pupils—All Cities		
K Group....	26	52	22
N-K Group..	18	48	34
	Paired Pupils—One City		
K Group....	32	59	9
N-K Group..	26	58	16

The comparisons of achievement in reading are given in Tables II and III. Of the four average scores on the Pressey First-Grade Attainment Scale which are based upon members large enough to be conclusive, none held a significant difference. That is, although in three of the four tests the kindergarten score is higher, there is no statistical guaranty, if similar groups of children were tested at similar periods of school life, that the children who had attended kindergarten would make better averages on this first-grade reading test. For the pupils of equivalent ability throughout the eight cities (Paired Pupils—All Cities), there was either no difference in the average scores or the difference was not significant.

TABLE II

Pressey First-Grade Attainment Test

	Form A October, 1923	Form B January, 1924
(1)	(2)	(3)
	Whole Group	
K Group......	15	29
N-K Group....	11	23
	Paired Pupils—All Cities	
K Group......	15	32
N-K Group....	15	30
	Paired Pupils—One City	
K Group......	17	31
N-K Group....	22	31

TABLE III

Haggerty Reading Test

	Form A June, 1924	Form B June, 1925
(1)	(2)	(3)
	Whole Group	
K Group......	11	24
N-K Group....	10	22
	Paired Pupils—All Cities	
K Group......	10	22
N-K Group....	12	24
	Paired Pupils—One City	
K Group......	11	23
N-K Group....	12	23

The differences between the achievement of the K and N-K Groups on the two forms of the Haggerty Reading

Test were not significant. Apparently, at the end of the first grade the slight advantage in reading held by the kindergarten children after eight weeks and again after one semester in the first grade is lost.

Similar facts (not shown here) appeared when the scores on the four tests of the Pressey Second-Grade Attainment Scale at the end of Grade II were compared. In no case was the difference significant, nor was there a tendency for the advantage to fall consistently to either group.

This attempt, to determine the advantage in the first grade held by children who had attended kindergarten in contrast to these who had not, seems to yield two conclusions. In social activities such as oral language, industry, and initiative—activities which were given special attention in the kindergarten—the kindergarten children rereived more good ratings and fewer poor ratings than did their classmates who had not attended kindergarten. In first-grade reading, the kindergarten children showed a slight advantage up to the end of the first semester. By the end of the first grade this difference was lost, nor could it be again detected in the average achievement in spelling, arithmetic, or reading of Grade II.

LATIN—MODERN LANGUAGE

W. S. HENDRIX, *Ohio State University*, Presiding

FOREIGN LANGUAGES FROM THE POINT OF VIEW OF A CITY SUPERINTENDENT

CHARLES S. MEEK
Superintendent of Schools, Toledo

Modern languages found a place in the curriculum of the public schools as the result of a progressive protest against the classical-school program in which the so-called "dead languages" formed the core. Arguments were advanced in favor of modern languages which are now being used for the newer school activities.

The classical languages were time-tested, had been tried, and found worthy. They were regarded as so essential to training for leadership that a false Latin accent used by a member of the British House of Commons branded him as an illiterate and ultimately lost him his seat. The utilitarian claim for the modern languages was as nothing against the cultural value of classic lore.

The entire foreign language group is united in defense of the status quo, while to the foreign-language teachers is committed the sacred obligation to pass on to the children their priceless heritage—the culture and scholarship of the age. Against the claims of the promoters of the newer school activities for a more important and a more universally recognized place in the sun, the language group has been determined and militant.

This was the situation when I began to administer public schools as a superintendent. According to the conception of education prevailing then, there was a demand that the curriculum and instruction in the high school should be adjusted to the needs and the demands of all groups and all types of pupils, rather than to require that all groups and all pupils should adapt themselves to a rigid institution.

In keeping with this conception, the curriculum was rapidly being liberalized and electives were being permitted. More extended courses in history, English, science, and applied arts were being offered.

A play which John Mason made famous some fifteen years ago was *Milestones.* The theme of this play was that the progressives of one generation become the conservatives of the next. Being young and aggressive I became the champion of the newer school activities and of permitting pupils to elect such studies as would prepare them for labor in life at the completion of their high-school courses. I was thus called upon to defend these newer courses, as I was responsible for the departure from tradition in promoting them. In those days, I lived a strenuous and adventurous life. As the guest of charming young hostesses I ate biscuits and chops at numerous exhibit luncheons and dinners. I thus became a sort of standardized test to measure educational achievement of these pupils. This was disturbing and, at times, even distressing to me as the median of these pupils' performances was considerably below my normal expectancy at home. The curriculum allowed one day for the girls to learn to cook chops and two for preparing and baking biscuits, and I had hoped to eat chops and biscuits for many years.

We trained the girls in costume designing and in dressmaking only to learn that no one designed and made her own dresses, for ready-made dresses were better and cheaper. We learned, by means of a survey, that where professional dressmakers formerly employed fifteen or twenty sewing girls, they now employed only one or two. The itinerant dressmaker who went from house to house for employment for a day or a week in each home is now almost as nearly extinct as the buffalo.

In visiting a high-school manual-training exhibit, I was impressed with the beautifully designed and constructed mission furniture I observed. My satisfaction was all dissipated the next day when I learned that furniture stores had not offered a piece of mission furniture for sale for ten years. The boys under expert instructions became experts in tearing down the cars in the auto-repair shops, but they could not put the parts all back much less make the cars run. Claims of patrons of the school for damage to cars were numerous and clamorous. Organized under the Smith-Hughes Law we conducted enormously expensive classes in vocational training. We prepared the boys at great expense in time and money for plumbers, gas fitters, house builders, and foundry workers only to learn that only 8 percent of the boys ever entered the trade for which they had been prepared—for the truth of this refer to the Rochester survey.

In a course in animal husbandry we trained students to raise poultry. On a plot of ground owned by the Board of Education we built houses and fenced lots for a poultry ranch and induced the Board of Education to purchase many expensive fowls of various species. From books we learned with scientific accuracy the egg producing propensities of each species, but in our experience not one of the hens acted with the profusion and precision that she did in the books. Instead of producing young chickens they generated all species of parasites and infections and died in great numbers. The neighbors compelled us to dispose of our stock, tear down our buildings, and go out of business. They did this in exercising their right under the law that free and independent American citizens may legally abate a public nuisance.

I learned that in these newer school activities the public soon comes to know with disturbing exactness the extent and nature of our successes and also the extent and nature of our failures, and I frankly admit that what the public has found out has almost invariably caused me more anxiety than elation. Consequently, the quest for adventure does not appear so alluring as it did before I acquired some valuable though painful experience, such as I have been narrating. I am coming back to a more wholesome respect for the foreign languages than that which characterized my early professional life. Educational adventuring cannot be as warm and comfortable and sociable as sponsoring that which has the sanction of an enriched and glorious past; for that which is thus sanctioned is accepted with all the unreasoned faith of a creed, and gives the feeling of a cozy fireside while the winter storms are raging without. My change of faith illustrates the truth of *Milestones;* the progressive of one generation does become the conservative of the next. Even as a conservative and an advocate of all that you claim for the modern languages, I have my troubles. One of my difficulties is the great percent of failures among pupils who elect the foreign languages. The alphabet is more popular with foreign language teachers as it progresses from "A" downward. Parents who are unreasonable constantly complain because of the great number of their children who fail. It almost seems that the foreign language teachers conduct a selective rather than an educational agency. To pass is the reward of being bright and to fail is the penalty of being dull. You train a great number of students into a hopeless acceptance of their own incompetence. I understand, of course, the reason for your ruthlessness. The sacred standards of the past must be maintained as a sort of rite, a ceremony, a creed regardless of what havoc is worked in the lives of young students. It is entirely proper that modern investigations as to individual differences among pupils should find you cold, irresponsive, immobile. It is your right to maintain a sieve at the doors of your courses through which only the finer grades of the community may pass. True to the traditions of the past, yours is yet the high-toned job of training the community's elect. Accepting that as your mission in our school we once decided that no "C" or "D" pupils might elect a foreign language. This device seemed to afford a most satisfactory escape from all our difficulties. As it turned out the escapes were few and they were hairbreadth. Many fathers who had graduated from Harvard and many mothers who had graduated from Wellesley had "C" and "D" pupils. It was simply astounding how many graduates of the Harvards and the Wellesleys all over the land were found who were the fathers and mothers of "C" and "D" children. It was a complete refutation of Sir Francis Galton's contention that genius is hereditary. Of course, all of these fathers and mothers wanted their children to study the foreign languages in order that they too might go to Harvard and Wellesley. There is one difficulty of the foreign languages from a superintendent's point of view. We could not get the parents and the teachers to agree as to who were the community's elect.

Against this I want to present a phase of your work which we superintendents find comforting and reassuring. Your pupils are always alert and at work. Listlessness is rarely ever apparent in a foreign-language class. The assigned tasks are specific and clearly understood. The pupils know just what to do and just how to do it and derive an immense amount of satisfaction out of being able to do what is required of them. Pupils are always intensely interested in a foreign-language class, but interest is not enough. We all know how a year or so ago a craze to do cross-word puzzles swept throughout the world. Given skillful teaching, children will get intensely interested in anything.

Some years ago the culture epoch plague of education descended upon us. It was several years before that microbe rendered us immune when the infection was at its peak and afforded us relief. On the theory that the child's development epitomizes the race's development a course of nature study was designed which assigned to the first-grade pupils the study of the lowest form of life. As the easiest attainable specimen of the lowest form of life the oyster was suggested. One skillful primary teacher worked her pupils up to such a pitch that before Christmas they were as keen about the oyster as they were about Santa Claus. The problem was, of course, not the interest in the oyster but what the oyster meant in the lives of those first-grade pupils. As far as I am concerned, the oyster's mission here on earth is to promote indigestion, transmit typhoid fever, and remind us of some of our acquaintances.

Any superintendent, who is not completely immersed in cost-accounting or a building program, wants to know first the objectives of the activities he is supposed to direct. Quoting from a foreign-language course of study, I find "The most apparent objectives are to train the student to read, write, understand, and speak the language studied." I studied Latin seven years and French and German three years each. I can still repeat all the Latin orations and the Latin poetry I committed, but I cannot express the simplest thought in either German or French, and I doubt if ever I could. The other day one of our foreign-language teachers, in her own adopted tongue, hurled some lingo at me. I sensed that she was saying something facetious about my acceptance of this place on the program, but I could not understand a word she said, and she knew in advance that I could not. I doubt if she would have been so glib had she thought I could. In all other lines, a superintendent is expected to make some contributions, but the foreign-language teachers expect nothing of him but to be left alone. If we had nothing in the curriculum but foreign languages, how simple and happy our lives would be. The teacher who exhibited to me a bit of her foreign-language curriculum was not attempting to test me or humiliate me. She is a lady of good taste and good breeding and she would never thus violate one of the social amenities. She merely assumed that I had forgotten all I had ever learned of a foreign language just as any busy and sensible man would. I asked a young college graduate who had studied French four years in high school and two years in college and is going to Europe this summer, if she could speak French. In some surprise she replied, "No, of course not. I did not have any conversation courses." My impression is that you teach only a rather inconsiderable minority of your students to speak the foreign language. I am not particularly disturbed about this, as I have always known it and have become reconciled to it. But I do know that, like busy work in the primary grades, foreign-language studies keep the students occupied, interested, and out of mischief.

I say that I have become reconciled to the fact that you have not taught many of your students to speak the foreign language, but I have assumed that the teachers could speak it with facility, accuracy, and precision. A few years ago, however, I received a shock that disturbed my satisfaction in that assumption. A former student returned from the war bringing with him a French friend he had acquired. This young man spoke English very well. Our graduate took him to the high school to meet the French teachers. The young man told me afterwards in a bewildered way that the teachers could not understand his friend's French and that he could not understand theirs.

Why worry about the problem anyway? A survey conducted a few years ago in New York revealed the fact that very few students—as I remember it, about eight in a thousand—ever use in life the foreign language they studied in high school and college. To learn to speak the language is an announced objective as yet unrealized.

The educational work conducted in the Ford automobile factory demonstrates that the job can be done in sixty lessons. Foreigners are taught to speak and to understand such English as they will need as workmen. The teachers there do a better job of teaching a foreign language than those in any high school or college have ever done it. I suspect the reason this is true is that the situation is different in the Ford factory from that which exists in any school or college. In the Ford factory cost-accounting is soulless and ruthless. Teachers must quickly realize their objective or lose their jobs. No alibi is accepted. In the high schools and colleges the law of the Medes and Persians is not rigidly applied. The students too in the Ford factory have a vital motive in their work. If they do not learn to speak and understand English they do not get a job. In the schools and colleges no such compelling motive operates, either in teachers or pupils. In the Ford factory the teachers do that job because they must. We in the schools have failed to do that job because we may.

To learn to read the language is another of our announced objectives. Boys and girls read six books of Virgil as a definite cultural school course. How many of them at the close of the process are cultivated enough to read the remaining six for themselves? What other Latin authors do they read when relieved of compulsion or deprived of ponies? I know how meager is the amount of reading required in modern language in the high schools. When students are required to read a novel written by Goethe, Hugo, or Balzac do they voluntarily read another with merely recreatory intent and do they extend their interests to Voltaire and Rousseau? If not, then they will not attain another of your announced objectives, that of procuring new, interesting, living, and vital information about the foreign country, its customs and manners, its literature and art.

If you are not satisfied with your success in attaining the more direct aims which I have been discussing, you may, of course, fall back on the value of studying foreign languages as affording effective mental discipline. We do that in justifying every subject in the curriculum. When all our arguments in favor of a place for any subject in a crowded curriculum have all been refuted, we fall back upon its disciplinary value. In finally advancing the mental discipline argument we are like the physician who had a sure cure for "fits." When he did not know what was the matter with his patient he threw him into fits and then he knew he could effect a cure.

Mental discipline is an impressive phrase. We all know people who have not studied foreign languages. Are they or are they not mentally disciplined? Is Henry Ford mentally disciplined? If so, he received his mental discipline through something else than the study of foreign languages. Have we sufficiently considered the possibility or feasibility of an alternative to foreign languages as a means of procuring mental discipline? Are there conceivable or imaginable ways, or as in Mr. Ford's case, actual ways, of disciplining the minds that are, might I say, less slow, less uncertain—to some persons, at least, less repugnant—than the study of foreign languages? Is it possible to get any mental discipline through subjects that for some pupils have other and more direct uses and advantages? Who gets the most mental discipline from the study of foreign languages—the pupil who works hard and never really succeeds, or the student to whom it comes easy, so that he never has to work hard at all? How do bright children get any mental discipline anyhow? If things come easy isn't the disciplinary exercise slight?

Should a discussion follow this talk, please remember you are not to hold me responsible for the truth or the accuracy of a thing which I have said. It has all been presented as an educational cartoon. I have merely given an exaggerated slant to Ben Butler's slanting eyes, over elongated Jim Baine's elongated nose, out pugged Boss Tweed's pug countenance. I listened over the radio recently to an eloquent address of Senator Borah at a dinner in New York given by the Association of Cartoonists of America. The Senator's address was a tribute to the services which newspaper cartoonists have rendered to civilization. If newspaper cartoons may be so thought provoking, I shall be satisfied if my educational cartoon may, with some effectiveness, put up to you the challenge this story suggests.

LATIN SECTION—ADJOURNED MEETING

W. S. Elden, *Ohio State University*, Presiding

HABENT SUA FATA LIBELLI

Hilda Buttenweiser
University of Cincinnati

The adventures of the manuscript provide us with a story of many thrilling chapters, for the classical authors during the long centuries since they wrote their books, thanks to the whims and carelessness of men, have suffered endless vicissitudes. Some of them are entirely lost, others have been miraculously rescued from oblivion, a number owe their life to the preservation of a single manuscript.

In our accounts with ancient literature there is thus a debit and a credit side. On the credit side appears an odd list of manuscripts which have delighted scholars for a time, but which have later been pronounced pretenders. It is with some of the more interesting forgeries of classical manuscripts that this account concerns itself.

The Renaissance, with its awakened zeal in classical authors and hairbreadth recovery of ancient manuscripts, was naturally enough the hey-dey of forgery. The escapes of many manuscripts were so uncertain that anything seemed possible. We see, however, that our own more critical age can still be duped.

Some of the forgeries present only the text of the author, as does the *Consolatio* of Cicero which Sigonio published in the sixteenth century. Some clever frauds, however, are paleographical, actually providing a manuscript or facsimile of a manuscript as a basis for the text. These vary in length from the wholesale forgeries of entire works of classical authors perpetrated by the notorious Constantine Simonides, to brief fragments such as the "Anonymous Cortesianus." Some have enjoyed a life of a few weeks or months. Many have imposed on the learned world for several decades.

By reviewing a number of interesting forgeries, which range from the sixteenth century down to the Livy hoax in the autumn of 1924, and examining the methods by which they have been proved fraudulent, we learn a valuable lesson in paleography. We perceive, moreover, that twentieth century scholars, despite their critical acumen and paleographical knowledge, can still be deceived by forgeries. It is safe to say, however, that there are no hoaxes that are not in time discovered.

FUNDAMENTALS FOR THE LATIN TEACHERS: LATIN AND ENGLISH

H. F. Scott
Ohio State University

Two topics have been chosen rather than one in order to give a wider opportunity for discussion. The two topics are "Cooperation with the English Department" and "Poetry in the High-School Latin Course."

The first of these involves the question of English idiom in translation. Latin teachers are sometimes censured for permitting pupils to use Latin participial constructions to such a degree as to influence the standard of English used in writing. On the whole, it seems doubtful whether there is any real effect of this sort, but at any rate it is worth while to avoid possible criticism by constant attention to the use of good English in translation.

There are other phases of relation, however, between the two departments. It is possible to so direct the Latin work as to make it contribute to the pupil's mastery of the mechanics of writing. Sentence form, punctuation, and other details of composition may be stressed so as to give the Latin pupil a marked advantage over the pupil who has no Latin. English teachers are always appreciative of such help.

The most important contribution of Latin to English, in the minds of many teachers, is in the field of vocabulary, chiefly through the study of derivatives. This element of Latin study is sometimes exaggerated, but its value cannot be questioned. The narrow limits of word knowledge on the part of the college student indicate the need of help in expanding the high-school pupil's vocabulary before he completes the course which entitles him to enter college.

The second topic suggests the question of the grade in which poetry should be taught. The earlier course assigned Virgil to the third year and Cicero to the fourth. The Committee of Ten advised teaching Cicero in the fifth and eighth semesters of the four-year course, placing Virgil in the last half of the third year and the first half of the fourth year. This plan has definite advantages, but the necessity for the purchase of two textbooks for the third year has made it undesirable in most public schools.

A more serious problem which affects a larger number of schools is how to teach Virgil satisfactorily to a class of which part have had one year of prose and part two years. This is an undesirable arrangement but it seems unavoidable in many schools. Ovid has been given a larger place in the course as a result of the inclusion of selections from his poems in the college requirements for the present schedule. Some teachers have found it desirable to include some selections from Ovid as a transition course at the end of the third year. The interesting character of the stories makes an appeal at this point for the pupil to continue and prepares him to real Virgil more easily.

The teaching of mythology must be closely associated with the teaching of poetry, and here the two topics unite. In teaching mythology through the medium of the stories we are enabling the pupil to comprehend a large part of his English literature which has otherwise little meaning to him.

MATHEMATICS

S. E. Rasor, *Ohio State University*, Presiding

RECENT TENDENCIES IN CURRICULUM ORGANIZATION OF MATHEMATICS IN THE SECONDARY-SCHOOL CURRICULUM

V. T. Thayer
Ohio State University

The present trends in curriculum revision began in 1890 with the twofold demand of Charles W. Eliot and others that the period of secondary and college education be shortened, and that the number of subjects in secondary schools be reduced in number. They framed the second question much as follows: "What subjects should be taught and how should they be taught to those boys and girls competent to attend the secondary school?

The enrollment in secondary schools today indicates that a different conception now prevails. These schools are attended by children with varied types of minds who plan widely differing life careers. The secondary school today is viewed as the culminating stage of general education and is responsible for preparing normal boys and girls for an intelligent participation in democratic life.

This new view has manifested itself in the junior and senior high-school organization in which the junior high-school period functions as an experimental and discovery period and the senior high school functions as a differentiated institution preparing pupils for higher institutions or for entrance into commercial, industrial, or agricultural life through a relatively specialized curriculum. The prevailing tendency in the reorganization of mathematics is to provide general mathematics in the junior high school and segregation in the senior high school. This is accomplished by providing electives in mathematics for those pupils preparing for college or technical schools which require algebra or geometry for admission. This tendency restricts the mathematics of the pre-vocational curricula to trade or vocational application of elementary mathematics.

The contention is made that however sound this policy may have been some years ago, there is evidence to question its validity at present. Studies made of the type of high-school graduates who now enter a higher institution indicate that it is no longer true that only the best academic minds go to college. Consequently, the pre-vocational curricula should be organized with reference to the cultural and vocational needs of at least two types of students —those who require practical training and those who can be stimulated to develop the cultural implications of their vocations. In mathematics, this means offering more than trade mathematics. It also means organizing courses which develop the mathematical concepts and relations implicit in business organization, industry, and agriculture. It means, in other words, the humanizing of mathematics.

FUNDAMENTAL SKILLS IN NINTH-GRADE ALGEBRA

B. R. Buckingham

Director, Bureau of Educational Research, Ohio State University

I well remember the first words of the algebra textbook I used as a boy. "Algebra," sententiously remarked the author, "is universal arithmetic." For many years I wondered what that meant. I now know that it was the best of definitions and also the worst—best because it puts a great truth briefly, worst because no student who begins the study of algebra can possibly comprehend it.

We no longer think of definitions as of fundamental, initial value in the study of a subject. We look upon algebra, as well as some other school subjects, as calling for the acquisition of certain fundamental skills. I would far rather that a teacher of mine had clear notions of what these fundamental skills were than that she should be expert in discussing, without settling, the question of the ultimate value of algebra.

What then are these fundamental skills in elementary algebra? We may speak of skill in algebra but by this we mean a degree of facility in a variety of ways. Thus skill in algebra may be analyzed into skill in the fundamental operations, skill in solving linear equations, skill in factoring, skill in graphs, skill in solving simultaneous linear equations, skill in solving quadratic equations. Each of these skills, however, is still further resolvable. The fundamental operations naturally break up into addition, subtraction, multiplication, and division; and each of these must be analyzed into still smaller parts if effective teaching is to be done.

The usual textbook in algebra devotes far too few pages to the introductory treatment of the subject. There are certain important ideas which must be conveyed in a detailed manner, as the elementary symbolism of algebra –the meaning of ab, of a, of $a + b$, of the fraction $\frac{a}{b}$. These meanings cannot be conveyed merely by stating them. The pupil must practice them.

We have rendered algebra—and arithmetic, too, for that matter—gratuitously difficult by using a senseless variety of expressions for the same thing. Simplicity and directness could be achieved if we adopted only one way of expressing a given relation. Why should we teach three or four ways of solving simultaneous linear equations and an equally varied number of ways of solving an affected quadratic?

Let us consider for a few moments the four fundamental operations. The usual textbook treatment of addition first introduces monomials with perhaps fifteen or twenty exercises in the addition of similar expressions. It then brings forward polynomials and gives them a much more extended treatment. I should reverse this process. If a child knows how to handle monomials, the handling of polynomials in algebra is easy. The addition, subtraction, multiplication, or division of polynomials is merely a succession of these same processes with monomials.

The handling of monomials in algebra is as fundamental as the handling of basic combinations in arithmetic. In algebra it is as essential that a child should know the various types of monomial division as it is that in arithmetic he should know the ninety fundamental facts in division.

I know of no more fruitful work for an organization of mathematics teachers than the analysis of addition, subtraction, multiplication, and division of monomial quantities first into logical or theoretical types and second into the types which really matter—that is, those which present distinguishable difficulties requiring separate treatment and practice. When this is done we may organize our approach to elementary algebra with scientific precision and with a far greater prospect of successful treatment in the classroom.

THE IMPORTANCE OF MASTERY IN TEACHING MATHEMATICS

W. D. Reeve
Teachers College, Columbia University

Our discussion is concerned mainly with the present low mastery of secondary mathematics and with what may be done to improve the results. We may well ask ourselves, at the outset, the following question: "What mastery should we expect in mathematics?" If we cannot expect complete mastery, what is a desirable and acceptable objective? The results of several examinations recently given to large numbers of pupils covering a wide area indicate that some of us are expecting far greater mastery than we are able to secure under present conditions. What is mastery anyway and how can it best be attained? It may help us to look at some of the facts discovered from recent experimental investigations.

It is always interesting to discover by carefully prepared tests what pupils actually know about certain things which their teachers are supposed to have taught them. We find that there are very few things which pupils know well enough to reproduce clearly on a formal test. Even outside of school, some of the products of the school are weak in simple arithmetic. The story is told of a girl in a big department store who asked a customer to buy a whole yard of some goods instead of a fractional part because it was "easier to figure out."

While teachers may insist that such situations as the one described are rare, anyone who is in a position to learn the truth knows that a great many pupils do not make progress after leaving school which is commensurate with the training they have had and the knowledge they are supposed to possess. Moreover, some of the success they attain is often due to natural growth in maturity rather than to application of power gained in the schoolroom.

Many contributing causes make the results of our efforts inadequate and disappointing. We shall refer to some of them briefly and shall discuss some of them more fully. Chief among those to which we can refer only briefly are the following: undue emphasis placed upon the results of individual examinations; lack of good standards in marking practices; unnatural and poorly supervised habits of study; failure to observe individual differences in ability and to classify pupils accordingly in homogeneous groups for teaching purposes; a lack of proper recognition by administrative officials of first class teaching, especially when certain measurable results are so easily obtained by the yardstick method.

It is impossible to justify the large percent of failures in mathematics reported by so many of our schools. Whenever the number of failures in a sufficiently large group exceeds 10 percent, the reason should be found. We must not expect universal success in mathematics any more than we expect it in life, but it should be possible to avoid mental bankruptcy in the former and financial bankruptcy in the latter. In each case the cause should be determined and the necessary remedy applied.

In educational parlance, the fact of individual differences explains why some people succeed better than others. The standards set by the schools, however, should not retard the progress of the large number of pupils who constitute what is technically known as the modal group. Indeed, even the mentally inferior group should be encouraged to advance as far and as rapidly as their powers permit, just as should the intellectual leaders, even though the progress be at a different pace and the ground covered be materially less.

It is true that the number of pupils attending high school has greatly increased during the past few years, both actually and relatively, and that their native capacities, life experiences, and purposes of study are much more varied. The controlling cause of the difficulty, however, is not here; it is found in our failure to make a careful analysis of objectives and to fit these objectives successfully to the various types which our diagnostic tests determine.

The problem is by no means impossible of solution. The success in improving the quality of instruction in arithmetic proves that. If we can better the work in the subject, we can do so in algebra and, indeed, in all the other branches of mathematics. We shall therefore consider briefly a few of the major difficulties which pupils encounter in mathematics and shall then suggest a few of the more important remedial measures to be taken.

One of the chief causes of difficulty in the study of mathematics is found in the failure of pupils to read understandingly. One of the chief causes of this failure lies in the lack of a sufficient vocabulary. In recent years, careful studies have been made of the minimum word lists to be expected of pupils in various branches of study, mathematics included. Our best modern writers have made use of the results and have sought to treat mathematics in simpler language than was formerly the case.

The teacher should remember that the greatest works are clothed in simple language. The greatest teachers have spoken to the world in words that children can comprehend. The small mind seeks to use difficult words; the large mind seeks to use simple ones.

This study of the proper vocabulary leads to many interesting investigations. For example, it is natural for an adult to ask what number is seven "more" than nine—a problem leading to addition. It is equally natural to ask how much "more" nine is than seven—a problem leading to subtraction. To the child, however, who hears the key words "more," "nine," "seven," it is often confusing to know whether to add or subtract; indeed, he may think of multiplying to find a number "more" larger, or of dividing to find how many "more" one number is than the other. The beginner has a right to expect such simplicity of language as will leave in his mind no doubt of the meaning involved.

A second cause of difficulty is found in the technical language of mathematics. It is for this reason that we have abandoned the use of the term "affected quadratic," the first word of which conveyed no meaning to teacher or child, and the second of which meant little to the pupil unless his teacher foresaw his probable difficulty and removed it. It is, therefore, desirable to simplify the technical language as much as we reasonably can, occasionally putting in place of the difficult word the meaning expressed in the language of childhood.

Related to the difficulty arising from the technical language of mathematics is that which is due to symbolism. This does not ordinarily cause as much trouble in algebra as in geometry, where the desire to introduce unnecessary symbols seems to be almost a mania with certain teachers. It is, however, serious enough in the former subject, some instructors resorting to symbolism that has no sanction in the mathematical world and no worthy reason for being in their own classes. The subconscious purpose is probably to appear original; the conscious result is to add to the pupil's burdens.

Finally, the beginner in algebra may have troubles because he fails to use all the necessary data in a problem. Even though most textbooks give precisely the needed data and no more, pupils will frequently fail to use all of it, and the result is a failure to reach a solution. If we should state problems with insufficient data, or with some that is irrelevant, as some writers have attempted, the situation might become even worse. The remedy for the difficulty seems to be in giving a great deal of practice in problem reading after the manner of our best silent-reading devices.

In education, in general, and mathematics, in particular, it is a bad practice to establish two or more habits when one is sufficient. It is not desirable, for example, to teach a beginner two methods of algebraic subtraction, four methods of factoring, or four methods of solving a quadratic equation. Later in the course, various methods of doing a specified thing may be discussed, but for a beginner it is desirable to develop one plan for each case and adhere to that until its use has become automatic. What might be called the development of uncertain attack merely wastes time and confuses the pupil.

The pupil beginning algebra brings with him certain ideas which are correct in arithmetic but which do not apply to algebra. In arithmetic he has acquired the habit of proceeding from left to right in a case like

$$2 + 3 + 9 - 4,$$

a rather useless but common problem. He applies the same principle to the case of

$$a + b \times c - d,$$

although the usage in algebra leads to the multiplication first. As a result, he tends to multiply $a + b$ by c, and then to subtract d.

Similarly, every teacher has found that pupils often tend to cancel the a's in a case like the following:

$$\frac{a + b}{a} = \frac{\cancel{a} + b}{\cancel{a}} = b$$

To avoid such incorrect transfer it is essential to provide abundant practice in attaining the correct objective in every typical case.

While it is a good principle to prepare for a particular skill just before reaching it, this is not always the best way. In addition, for example, we prepare for several things, and it is not feasible to place addition immediately before each. By way of illustration, in solving equations we need to add and to subtract horizontally, but it is not desirable to hold this work until a particular need is felt; it is much simpler and more natural to prepare for the future need while we are on the special subject of addition. With only a little practice the pupil can add one-figure numbers horizontally as easily as vertically, and this should form a part of the work in addition.

Every teacher of algebra has probably been disturbed because some of the pupils fail to generalize correctly from particular cases; that is, they fail to make a correct induction. If a pupil is to learn to make his own generalization when alone, he must have plenty of practice in discovering probable general rules from special cases and in stating these rules accurately. This does not prove the rule; it is merely a method of discovering the probable. It is then that the mathematical mind undertakes its particular task—that of proving that the probable is really a certainty.

Obviously, not all children are equally gifted in anything—for example, in this power of generalizing. The tendency is to neglect the mentally inferior pupil and to give only the mentally superior ones the opportunity of expression. Since time is valuable, the teacher often gives the generalization himself, without waiting for anyone to show his own originality. This procedure, however, is not justified. More time is wasted by undue haste than by concentrated practice on desirable habits, such as reducing the number of steps to a minimum in arriving at some particular generalization.

There exist in mathematical problems, and particularly in arithmetic, what are known as inverse cases. The name is meaningless except that one operation is arbitrarily called direct and the other is then its inverse. For example, if we say that $2 \times 3 = x$ represents a direct case, then $2 \times x = 6$ may be said to be its inverse; but if we say that $2 \times x = 6$ represents a direct case, then $2 \times 3 = x$ is its inverse.

The term is frequently used in connection with percentage, and

$$5 \text{ percent of } \$100 = x$$

is spoken of as the direct case. This being so,

$$5 \text{ percent of } x = \$5$$

and

$$x \text{ percent of } \$100 = \$5$$

are inverses of the first. Such cases in arithmetic present some difficulties for the child. He knows that he is to divide but does not know which is the divisor. As soon as he has the algebraic symbolism to assist him, however, the difficulties are negligible; he has merely two easy equations to solve. Other similar cases, all involving essentially the simple equation

$$ax = b$$

are treated in the same manner.

One of the most frequent failures in the teaching of algebra is due to the tendency to see an objective as a single entity, when as a matter of fact it may seem complex to the pupil. The solution of a mathematical problem is rarely an exercise of a single skill; it almost invariably requires not merely several skills but the ability to coordinate them. To take an example from arithmetic, a child may have perfect mastery of the six skills involved in

$$4 \times 5,\ 4 \times 8,\ 4 \times 2,\ 6 \times 5,\ 6 \times 8,\ 6 \times 2$$

besides those involved in simple additions, and still be unable to multiply 582 by 46, an operation which requires precisely these elements. Where he fails is in the coordinating of all this work, and where the teacher fails is in the neglect of drill upon this coordinating skill.

Similarly in algebra, we need not only to see clearly the great objectives, but to analyze each into unit skills and then to coordinate these on a working basis. The teacher should be sure to give the pupils a chance to make every possible error which can occur in attaining the objective under consideration. In this way his deficiencies can be discovered and the remedy applied. This remedy consists in sufficient practice, particularly in the region of defects.

As an illustration of the failure to master certain of the fundamental skills in algebra a recent study[1] showed that 74.4 percent of a group of more than six hundred ninth-grade pupils could simplify the expression

$$7x + (-3x)$$

and that 70.9 percent could perform the following subtraction:

$$\begin{array}{l} +8a - 12b - 156 \\ -5a + 7b - 75\,. \end{array}$$

In other words, the former was nearly as difficult as the latter. The same study showed that for the same group of pupils it was considerably more difficult just to subtract

$$4x - 6y - 5x - 3y$$

than to perform the following subtraction:

$$\begin{array}{l} -ab + a^2 - 3b^2 \\ +ab - a^2 + 2b^2 \end{array}$$

even though the latter involved the subtraction of $+2b^2$ from $-3b^2$ which should be as difficult as anything in the former. In the first case, 29.3 percent of the answers were correct, whereas, in the second case, the score was 65.3 percent.

There are various possible explanations of the facts cited. That there should be such a difference in the scores shows how marked had been the failure to analyze objectives and to drill adequately upon the constituent skills involved.

The discussion of the preceding topic was destructive rather than constructive. The purpose was to show the faults of the failure to analyze. It is now purposed to make the criticism constructive and to show how it is possible to analyze objectives in such a way as to render more probable the development of all the skills involved in an operation. Because of the difficulty attending algebraic subtraction and the careful studies that have been made of the subject, we shall consider the case of subtracting one integral monomial from another similar one. In this operation, there are four typical situations to be considered.

1. *Subtraction of simple directed numbers.*—Under this head thirty-three major types are considered. In the tables,

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[1] Reeve, W. D. *A Diagnostic Study of the Teaching Problems in High-School Mathematics.* Boston, Ginn and Company, 1926. v + 177 pp.

m is the absolute numerical value of the minuend; s, of the subtrahend; and d, of the difference. The symbol (+) means a positive number with the sign expressed, like +5;

TABLE I

Signs	$m > s$	$m < s$	$m = s$	$m = 0$	$s = 0$
(1)	(2)	(3)	(4)	(5)	(6)
+ Expressed					
(+) — (+) . . .	+ 8 + 6	+ 4 + 9	+ 5 + 5	0 + 3	+ 3 0
(+) — (—) . . .	+ 8 — 6	+ 4 — 9	+ 5 — 5	. . . .	. . . .
(—) — (—) . . .	— 8 + 6	— 4 + 9	— 5 + 5	. . . .	. . . .
+ Omitted					
[+] — [+] . . .	8 6	4 9	5 5	0 3	3 0
[+] — (—) . . .	8 — 6	4 — 9	5 — 5	. . . .	. . . .
(—) — [+] . . .	— 8 6	— 4 9	— 5 5	. . . .	. . . .
(—) — (—) . . .	— 8 — 6	— 4 — 9	— 5 — 5	. . . .	. . . .
+ Expressed once					
(+) — [+] . . .	+ 8 6	+ 4 9	+ 5 5	. . . .	. . . .
[+] — (+) . . .	8 + 6	4 + 9	5 + 5	. . . .	. . . .
— Expressed once					
0 — (—), (—) — 0	. . . .	. . . .	. . . .	0 — 3	— 3 0

NOTE.—Symbol enclosed in parentheses indicates that symbol was expressed, when enclosed in square brackets it indicates that the symbol was not expressed.

[+] means a positive number with the sign not expressed, like 5; and similarly for (—) and [—]. Cases in which $d = 1$ are omitted in Table I, as are also the cases of

$m = s = 1$ and $m = s = 0$, although for completeness they should be considered as in Table II.

TABLE II

Signs	$m>s$	$m<s$	$m=s$	$m=1$	$s=1$	$m=s=1$	$d=1,+$	$d=1,-$	$m=0$	$s=0$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
+ Expressed										
(+)—(+)	+8a +6a	+4a +9a	+5a +5a	+ a +7a	+3a + a	+a +a	+5a +4a	+4a +5a	0 +2a	+2a 0
(+)—(—)	+8a —6a	+4a —9a	+5a —5a	+ a —7a	+3a — a	+a —a	......	......	....	....
(—)—(—)	—8a +6a	—4a +9a	—5a +5a	— a +7a	—3a + a	—a +a	.....	......	....	....
+ Omitted										
[+]—[+]	8a 6a	4a 9a	5a 5a	a 7a	3a a	a a	5a 4a	4a 5a	....	....
[+]—(—)	8a —6a	4a —9a	5a —5a	a —7a	3a — a	a —a	......	......	....	....
(—)—[+]	—8a 6a	—4a 9a	—5a 5a	— a 7a	—3a a	—a a	......	......	....	....
(—)—(—)	—8a —6a	—4a —9a	—5a —5a	— a —7a	—3a — a	—a —a	......	......	....	....
+ Expressed once										
(+)—[+]	+8a 6a	+4a 9a	+5a 5a	+ a 7a	+3a a	+a a	+5a 4a	+4a 5a	0 2a	....
[+]—(+)	8a +6a	4a +9a	5a +5a	a +7a	3a + a	a +a	5a +4a	4a +5a	....	2a 0
— Expressed once 0—(—), (—)—0.	....	....	....	....	....	....	......	......	0 —3a	—3a 0

2. *Subtraction of one monomial from another, a single letter, no exponents expressed.*—Under this head sixty-eight major types are considered. The preliminary remarks under the preceding case apply to this one, except that the letters relate to the coefficients.

3. *Subtraction of one monomial from another, two or more letters, no exponents expressed.*—Under this head the sixty-eight major types of the preceding paragraph are included. With some pupils the transfer will readily be made from a case like $8a — 4a$ to $8ab — 4ab$, so that this paragraph does not usually lead to sixty-eight new types. For others, however, the transfer is not immediately evident, and, in this case, considerable drill may be required.

4. *Subtraction of one monomial from another, a single letter, an expressed exponent greater than unity.*—As in the preceding case, sixty-eight major types need consideration and there will be some transfer from Nos. 1 and 2, but this will not be so apparent as in the case of No. 3. The reason for this last statement is found in the fact that pupils will often subtract exponents, just as they often add them in cases like $8a^2 + 4a^2$.

In an experiment recently made in Grade VIII, after situations described above were analyzed, it was decided to teach the subtraction of one simple directed number from another, basing the work on the analysis made in the first case. Two days were spent in teaching this topic and all the various types of difficulties were discussed in class. On the third day a test, including all these types of difficulty, was given to a class of twenty-four children. Neglecting a few chance mistakes which always occur, we may say that the pupils had mastered the topic, at least for the time being, in a satisfactory manner.

It was then decided to find out how well the pupils could master the various types of difficulty shown in the second, third, and fourth situations described above, without any further teaching of the idea of subtraction. This was done for the purpose of ascertaining to what extent transfer could be trusted in producing satisfactory results. No reference was made in class to these cases and tests were constructed which gave the pupils a chance to master each type of difficulty.

So far as the class of twenty-four pupils is concerned, it is safe to say that we cannot rely upon transfer for all pupils. In the case of the superior pupils, the transfer will usually be made, but, in other cases, the teacher will often have to give the matter special attention.

Some of the superior pupils who had been taught how to subtract 12 from —8 were successful in subtracting $12x^2$ from $-8x^2$, while in certain other cases the pupils subtracted one exponent (^{2}) from the other, became confused, and did not know how to proceed further. A few thought that inasmuch as 2 from 2 is zero the entire result should be zero. These are but instances of many similar mistakes which were made in a relatively small group of twenty-four pupils. It is evident that in a larger group more difficulties would appear.

The results show that, after division had been studied, all types under the fourth case should be given special consideration in order to insure a better understanding of the process.

While a similar experiment involving a larger number of pupils should be carried out and the method extended to other objectives than those in subtraction, the results described lead to the following conclusions.

In the subtraction of similar integral monomials there are apparently 101 typical difficulties (and probably 169 or more for many pupils) which are different enough to be considered separately. If we include such types as $0 - 0$ and $\pm 1 - (\pm 1)$ we shall increase the number to more than 170. It is possible that a more complete experimental analysis will show some of the skills herein discussed to be duplications, but the facts should be determined by actual trial in the classroom.

In spite of the difficulty for certain pupils, it is evident that many teachers have not considered the attainment of the subtraction objective a difficult one. Mathematically, it seems simple enough; psychologically this is not the case. This is shown by a recent attempt of a certain teacher to secure satisfactory mastery in subtraction by developing with his class only three of the possible thirty-three shown in Table I. This teacher used the following examples as a basis:

$$\begin{array}{r} +8 \\ +5 \\ \hline \end{array} \qquad \begin{array}{r} +8 \\ -5 \\ \hline \end{array} \qquad \begin{array}{r} -8 \\ -5 \\ \hline \end{array} .$$

He then announced the conventional rule for algebraic subtraction, evidently without realizing that there might be trouble later for certain pupils if they were asked to subtract $+6$ from 0, or $-4x^2$ from 0, or even $+6x^2$ from $-2x^2$. A diagnostic test would no doubt reveal many difficulties in the path of his pupils. This teacher had not kept in mind the proper method of an inductive approach to the rule and the need for analyzing an objective into various components.

We need first to arrange the subject-matter of algebra possessing known and varying amounts of practice in terms of the unit skills involved. Then, we must study the achievements of our pupils in relation to the practice they have received in trying to attain mastery. If they need a little practice to achieve satisfactory mastery—and we should determine within reasonable limits what this is—we should not keep them practicing on certain skills beyond the stage of diminishing returns.

It is possible to show how to teach many traditional topics better than we do, but certain of these things are not worth the teaching. It is necessary first, therefore, to select our objectives with care and then to analyze completely only those which are valid. This done we should, as far as we are able, make an analysis which will show how much each unit skill or group of such skills need be made the subject of drill. The next step is to arrange the subject-matter in a way to procure the best results.

The procedure is relatively so new that a more detailed statement is not worth attempting. A complete analysis of all the objectives has not yet been made. It is possible that it may not be worth making or, at any rate, considering seriously any further than in profiting by a study of the results.

MUSIC

ROYAL D. HUGHES, *Ohio State University*, Presiding

THE ART AND MECHANICS OF TEACHING

HAROLD L. BUTLER
Dean, College of Fine Arts, Syracuse University

As my time is limited, I have decided to confine my remarks to the teaching of appreciation of music. In my opinion, this is the music subject of most value to high-school and college students. Training for performance of any kind, whether in solo, in chorus, or in orchestra, or in smaller groups, is of great value, but unless regular practice is kept up after leaving school, the value is soon lost. With appreciation, on the contrary, no practice is necessary. Once acquired, the ability to appreciate is never lost. This is equally true of the appreciation of literature or of art. The only necessary qualification for the appreciation of music is a nature sensitive to music.

Before we take up the *how* of teaching musical appreciation, a few words concerning the nature of music may be apropos. Music may be divided into two general classes. The first is formal or decorative music, sometimes called classical music, in which, by abstract means, graceful line, symmetry of design, balanced proportion, and constant beauty of sound, the composer attempts the depiction of pure beauty and an appeal to the hearer's sense of beauty. This does not mean that emotion is entirely lacking in such composition. It does mean, however, that the arousing of feelings and emotions is not the end sought by the composer. Nearly all of Haydn's music and a large part of Mozart's is of this type. Practically all of the music of Scarlatti and Pergolesi, and of the glee and madrigal composers is of this type. At least one-half of Bach's music belongs to this class, including his two- and three-part inventions, his fugues, and many of his suites.

The second class of music is the romantic or expressionist music in which the composer endeavors to arouse in his hearers some universal human emotion or feeling—grief, joy, or a complex emotion. While Bach in his church music, Handel in his oratorios, and Mozart and Gluck in their operas showed a highly formal and symmetrical design in their works, emotion was the end sought. The works are highly formal because the composers were trained and all their experience was in the formal school. The form conventions were so strong that they were unable to break away from them. It was Beethoven who first felt the emotional urge in composition so strongly that he was unable to remain within the forms used by composers before him. The result was at first a great expanding of the old forms and, later, a departure from these forms. This brought down on him the condemnation of the defenders of pure beauty in music. Beethoven was followed by Schubert, Schumann, and the great ranks of the romantic composers who openly declared human feeling and emotion to be the goal aimed at in their compositions.

Just as emotion is not entirely lacking in the compositions of the formal school, so form and balance are not entirely done away with in the compositions of the romantic school. But, just as the formal composers made form—not emotion—the end sought for, so the romantic composers made emotion and not form the goal of their endeavors. Emotion with the formalists, and form with emotionalists, were simply by-products.

It is most interesting to observe how a great artist recreates these two styles of composition in a recital. In the formal compositions, he strives for beautiful tone, graceful delivery, variety of nuance, felicitous phrasing, and the architectural element in perfect symmetry and balance. In the romantic compositions, he strives for such variety of tone as will express any and all emotions, variety in characterization, fidelity to the mood of the composition, and, above all, such an eloquent delivery as will arouse strong feelings and emotions in the hearer.

If it is necessary for the performer to make this distinction, is it necessary for the teacher of musical appreciation to realize these differences and to take them into account in teaching his students how to appreciate the compositions of the two schools? Obviously, the answer is "Yes."

Is it not a fact that 90 percent of the music used in our appreciation classes in either high school or college belongs to the romantic school, or to the modern school of Wagner, Strauss, Puccini, Debussy, and other moderns, and that only 10 percent belongs to the formal school of Haydn, Mozart, Bach, and Handel? But, is it not a fact that a large percent of our appreciation teaching is analytic and only a small percent emotional and expressionistic? If this is true, haven't we put the cart before the horse? And why? Because most of our teachers of appreciation are trained in schools where the academic view of music is uppermost. To the formalist, music is a matter of rhythm, harmony, melody, form, proportion, and symmetry. The bones of music are mistaken for the spirit of music. One can pass an examination on the bones of music, for they give up all their secrets to the mind. They can be catalogued, pigeon-holed, and put in definite places. One can ask a plain question regarding them and expect an answer that is either correct or incorrect. This sort of knowledge is the fetish of the academic-minded teacher. Taught in this fashion, music has all the mental advantages of history, science, or mathematics. So, these teachers, wishing to impress superintendents, principals, and presidents with the educational value of the study of music, talk loudly of its disciplinary value, its mental value, its moral value, its physical value, its social value, and some proclaim its medicinal value. Are these the reasons Beethoven, Schubert, Schumann, Brahms, Berlioz, and dozens of other composers who have expressed themselves give for composing their master works, whether they be short songs or long symphonies? Most certainly not. Not one of these reasons ever occur to one of these men. Read their biographies, their letters, their critical works, and their sayings. All agree that their wish was to move, touch, and affect people by means of the spiritual, emotional, and imaginative powers of their compositions. Their appeal is not to the mind, but to the emotions and feelings.

Flaccus tells us that listening to music is "a communion with the composer on an emotional level." A study of the writings and sayings of great composers will show us that composition is a matter of mood and imagination, rather than of will and mind; that the composer is the slave of his mood and imagination, rather than their master. With Schubert, Schumann, Hugo Wolf, all of whom have told us how they composed, their imaginations and moods were aroused by poetry. The results were beautiful and expressive songs. Beethoven was aroused by the contemplation of nature in its manifold moods, and by reading the great dramatists, poets, and philosophers. He was at the command of his moods, and for this reason he worked on as many as four compositions at one time, in order to have something under his hand that would fit his mood—the mood that was not able to induce at will, but which came and went of its *own* will. For this reason, Beethoven was nearly four years composing one of his symphonies, and during twenty-seven years, from the age of thirty to the time of his death, he was able to compose only nine symphonies. His notebooks show us as many as nineteen versions of one composition, while four or five versions of one composition were common. Schubert tells that after reading a poem two or three times he could mentally hear the music which should go with it, melody, accompaniment, and all. His only task was to put it on paper just as he heard it. He wrote as many as eight songs in a day. Schumann tells us practically the same thing. He wrote as many as four songs in a day. Wolf would write like a madman for three or four months. Then would come an interval of from three to nine months in which he could not mentally hear any music. The result was no composition at all. And this, in spite of the fact that he was in agony of wanting to compose. In fact, the gradual lengthening of these barren periods and the fear that he would never be able to compose again drove him insane, and he died in a madhouse.

At no time did these men have any less knowledge of the laws of composition, of harmony, of forms, or of rhythm than they had the month before. Their mental ability was not less, nor was their will to compose lessened. In spite of this, they were not able, except as a mechanical and uninspired exercise, to write any music. With the exception of Wolf, they all wrote pot-boilers in order to get the necessary money with which to pay their bills.

All of this goes to show that the composition of music is not a mental effort, but an emotional and imaginative effort. When Beethoven studied composition with Haydn, the latter, a formalist, said of Beethoven, "He is an eccentric who will amount to nothing." The year of his death, Schubert, criticized by the formalists because his compositions showed so little use of counterpoint, went to Salieri for lessons. Whose music would you rather hear, Schubert's or Salieri's? Rimsky-Korsakoff, in his autobiography, tells us that he wrote his symphony, *Antar*, before he knew the names of the common chords, and had to take his manuscript to Balikireff to have the mistakes in musical grammar corrected.

But, says the teacher, "Granting all this is true, surely an analysis of their compositions will tell us how they got their results, and what it is that stirs us when we hear their music." Well, let us see.

Vincent d'Indy, the great French composer and director of the Schola Cantorum, in an address delivered in Paris, said:

> I have never failed to notice that the "good public, the public which is genuinely responsive to fine music, consists of two factions only: people who have a thorough knowledge of the art of music—these are very few—and people who know nothing, but listen earnestly and simple-heartedly. The "bad" public, which bandies words but does not know how to listen, consists of people who possess a smattering of knowledge. Being no longer unsophisticated enough to feel moved, because they think themselves learned, while they are not learned enough to judge soundly, they can neither understand nor enjoy.

Calvocoressi in his *Musical Taste* says that it is upon taste and imagination, and not upon any act of reasoning and analyzing, that the comprehension of music depends. Later on he says that theoretical considerations never provide a standard or proof of beauty, and again, that analyzing can only tell us *how* sounds are combined, without ever helping us to know why certain combinations are profoundly moving and satisfactory, and other very nearly similar combinations leave us entirely unmoved.

I should like to quote here Walt Whitman's poem, written after listening to a lecture on astronomy:

When I heard the learn'd astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and the diagrams, to add, divide, and
measure them,
When I sitting heard the astronomer where he lectured with much
applause in the lecture-room,
How soon, unaccountable I became tired and sick,
Till rising and gliding out I wander'd off by myself,
In the mystical moist night-air, and from time to time,
Look'd up in perfect silence at the stars.

Paul Krummeich in "The Spirit and Substance of Art" says that music lacks that capacity for satisfying curiosity; it gives no information. While a trained musician may emphasize the form, the message of music eludes his intellect and finds its way immediately to deeper, older sections of the soul. Music appeals to our feelings without being understood by a searching intelligence; yet its message is profoundly grasped. We assimilate music directly—by intuition; we enjoy it like a sunset or a blue sky. Who would care to analyze these phenomena, unless he be an astronomer? While the other arts permit of the objectification of a definite range; such are the possibilities and limitations of music.

Later on, the same writer tells us that while our intellectual faculties enable us to solve many of life's problems, there are phases of our inner life which defy our intellectual analysis; yet they demand expression and yearn for a sympathetic reception. There is a need of a communion on a deeper psychic level. Where all other means prove inadequate, music provides the infallible medium through which man may express the agitation of his soul. What he thus reveals is a vision of his subconscious life.

In explaining the analytic attitude he says that in order to avoid an incomplete description of music, we must not forget that there is another way of enjoying it—a kind of scientific *aperçu*. The study of the science of music—canon, counterpoint, and fugue—teaches us to analyze and to understand the form in its organization. Any trained musician may readily fathom the intricate organization of a composition and follow its presentation in critical fashion: Such is the attitude of the formalist, who cannot enjoy the substance of music because to him music is just form devoid of all content—an interesting arabesque. I, too, am capable of this scientific attitude, but prefer to enjoy the forest rather than count its trees. A pure enjoyment of music does not require a knowledge of canon, counterpoint, and fugue, because the substance of music is a purely human element—just emotions, joy or grief—and immediately accessible to all mankind.

That the trained musician enjoys an intricate musical structure more intelligently than the untrained is true; but does he enjoy it more? I have no misgivings in this matter and should gladly sacrifice my training and take a chance with the masses before accepting the sterile pleasures of the formalist.

From these quotations it seems evident that the appreciation and enjoyment of music are not aided by an analysis of its forms. In fact, I am certain that such a process fastens the attention of the mind on the form, and prevents the imagination from conceiving the content. I recently heard a supervisor analyze "Swanee River," Schubert's "Ave Maria," and MacDowell's "To a Wild Rose" within a period of forty minutes. It was exceedingly well done by a teacher who knew her business. It was so well done that I am sure every attentive student in the class will think of the form whenever he hears one of these compositions performed. In other words, for those students those compositions will be things of the mind and not things of the heart, the imagination, and the emotions.

Does this mean that no analysis is to be done, and that students are not to be taught the various forms of music? Most certainly not. The well-trained student should know a minuet from a waltz, a gavotte from a polonaise, an opera from an oratorio, and a sonata from a suite. No living, emotional music should be used in the process. Music of the formal school is well adapted for this purpose. Mozart, Haydn, Rameau, Bach, and Handel should be used rather than Beethoven, Schubert, Chopin, Schumann, and in fact, all composers of the romantic and modern schools. Practically no high-school student can keep his *mind* on the form, and his *heart* on the content, which means mood, emotion, and feeling. In fact, very few except matured professional musicians can carry on this double activity.

Practically all short musical compositions, vocal or instrumental, which men imagined entire or *en bloc,* will not stand formal analysis. This applies to the short pieces of even the formal composers. The person who is musically sensitive *senses* the short forms without any action of the mind, just as the composer intuitively composed in form without ever giving any conscious effort of the mind to it. This applies to all folk songs as "My Mother Bids Me Bind My Hair" by Haydn, "The Violet" by Mozart, "The Largo" by Handel, and a large number of short instrumental numbers by these same composers of the formal school. To analyze Handel's "He Was Despised" and "Hallelujah Chorus," Bach's "It Was Eventide" and "Forget Me Not," Haydn's "Spirit Song" would be fatal. Although they are in strict form, these composers were striving for emotional expression and not formal expression. Bach's two-part and three-part inventions, his canons and fugues, are strictly formal and can be analyzed without musical loss. When we come to the early suites, sonatas, concertos, and symphonies, we cannot choose in a hit-or-miss fashion, for in not all of them is form first and emotion second. Few of Bach's preludes need, or will stand, analysis.

When I was a voice student in Chicago, I also studied law and form and analysis at a university. I had sung with a great deal of pleasure Lotti's "Pur dicesti," seemingly a song of the formal school, but really of the emotional school. One day, the professor of form and analysis heard me singing it and asked me to sing it for his class. I did so. Immediately the professor explained that this was a great song because it was one of the first in which the composer used an irregular form. He then showed us that there were five repetitions of half phrases which made the song highly irregular in form and therefore very interesting. I had sung them all many times, and my *mind* had never grasped the fact that they were repetitions. I had sung them as emotional echoes of the feeling and mood of the phrase preceding—which they really were. The song promptly was killed for me, and it was six years before I could sing the song with the same sense of emotional freedom.

I had the same experience when a well-meaning teacher of English literature made us write out a prose paraphrase of the first fifteen verses of Gray's "Elegy." I received a mark of ninety for my paraphrase, but Gray's "Elegy" was never the same again to me. The bloom was off its poetic petals. I had counted its stamens and pistils, but at that time for some unaccountable reason the flower had lost its beauty and its odor. When the same teacher attempted the same process with Lowell's "Pictures and Appledore" and "The Vision of Sir Launfal" I rebelled and demanded to be transferred to the class of some teacher who had more heart and, perhaps, less mind. You see, the teacher was afraid we did not *understand* with our brains. So he evolved a scheme to make us understand. But, many of us didn't want to understand. We wanted to be moved, to feel, to thrill to the beauty of line and word and to be steeped in the wizardry of the poet's images. I am eternally grateful that I had the courage to get up and walk out and absolutely refuse to return.

You will want our students to not only know the elementary forms, but you will want them to know by sound and sight a violin from a flute, and a tuba from a bassoon. Use mechanical music for this purpose. It will be easier for your students to keep their heads when listening to this sort of music than should you choose the opening of the second movement of Beethoven's Fifth Symphony to show off the 'cello for example. The really musical student won't care whether it is a 'cello or a piccolo when he hears this wonderful melody. If he does, he won't be getting what Beethoven wants him to get.

Perhaps the three best-known commentators on music are Berlioz, Schumann, and Wagner—all well-known composers who certainly knew all the rules of composition and form.

It would greatly increase the teaching powers of anyone of us were we to make a study of their writings on the compositions of the great composers. Rarely will a phrase be found that has to do with the analysis of form. Their entire attention is given over to solving the imaginative and emotional depths of the compositions. They do not agree one with the other because, except in program music, music has no definite meaning which can be translated into mental terms. Whitman says that "Music is what awakens in us when we hear the instruments." It is needless to say that music varies in its effects according to the individual hearing it.

If I were a teacher of music appreciation—I once was—I would *talk* little about music, and I would *make* music all I could. I would consider it my chief duty to awaken my students and make them emotionally responsive to the beauties of music. I would remember that music speaks to us on an emotional and imaginative level and not on a mental level. Of course, I would teach the mental side of music, but I would insist that this side of music is the bones of music and not the spirit, and that the spirit of music cannot be comprehended by the mind, and will not yield its secrets to any form of mental analysis. I would be an assiduous reader of Berlioz, Schumann, Wagner, Grove, Mason, and a number of other writers who regard music as a spiritual or emotional language.

As far as the student is concerned, I would endeavor to make him sensitive and responsive. I would hesitate to give my own reactions but I would try to educe those of the student. First and last I would always remember that nine-tenths of all the music we hear was written to be enjoyed, rather than to be analyzed.

MECHANISTIC APTITUDE AND INTERPRETATIVE POWER IN MUSIC

Russell V. Morgan
Directing Supervisor of Music, Cleveland Public Schools

Definitions will be needed to make clear the terms used in the title of this paper. By "mechanistic aptitude" is meant the quickness and sureness of muscular response to stimulation of eye and ear. This response is revealed in the handling of any mechanism, musical or otherwise, and seems to have no relationship to musical talent. "Interpretative power" infers strong mental and spiritual reaction to any art message.

It will be noted that the topic is primarily concerned with instrumental music. Music of the human voice is a much more direct expression of feeling than that translated by the performer through an impersonal object. In the latter case, there is a sense of hiding behind the instrument and giving free play to feelings that would cause only embarrassment if expressed directly through song. This is probably the greatest single reason for the popularity of instrumental music among adolescents.

A considerable number of performers are not musicians but musical mechanics. It is not unusual to find students who have developed a remarkable ability to translate eye and ear impressions into muscular activity without being conscious of musical beauty. Yet this feeling for the beautiful in music is fundamental in the development of a true musician and performance is intelligent only to the degree that the performer is acutely conscious of the message of music.

Mechanical talent is precious and is essential to free and satisfying self-expression, but, after all, it is only a tool that is necessary in the production of a musical art work that is, in itself, a more or less beautiful flowering of a personality. In America, we can say with just pride that our instrumental music is making surprising strides in technical ability, but a question arises concerning equal development of interpretative power in music.

This leads to the theory that people with mechanical talent find easy expression for a comparatively small musical urge and that a sincere joy in music is often denied expression on the part of others where there is present little or no mechanical ability. This would seem to call for a careful appraisal of our musical activities to the end that we might discover how much of our work is mechanical and how much is expression of feeling.

Interpretative power, as stated before, is measured in the strength of the mental and spiritual response to beauty. Interpretation depends first upon a concept that is clean-cut in all details. This includes form, melodic, harmonic, and rhythmical patterns. Having made that image a part of one's self, freedom begins. Only halting utterance can be given a musical message when the performer has no conception of the composition as a whole and is only conscious of notes as he actually plays them. It is wise, therefore, to make every effort to cause the student to build up as complete a mental picture as possible. Having secured this, there comes the task of persuading him to release his personality, his whole being, if you please, in artistic expression.

School music has been concerned almost entirely with the re-creation of music. A distinct movement is now felt, however, toward encouragement of the creative aspect of music. Children of elementary-school age have a surprising talent for expression of feeling through original melodies. These melodies are often marked by definite feeling for form and musical interest. Creative music can certainly contribute to the growth of interpretative power. Every effort should be made to keep this faculty active during the school life of the child.

There is an unbounded energy in the American youth which is calling for some kind of self-expression. He must, and will, find ways of using this vital force. Music can be safely recommended as a major channel for expenditure of energy, for it will contribute so largely to the growth of the best side of the individual and of the community.

NON-BIOLOGICAL SCIENCE

William Lloyd Evans, *Ohio State University*, Presiding

THE USE OF GRAPHICS IN TEACHING GENERAL CHEMISTRY

J. E. Day
Ohio State University

The modern graphical method employed in the presentation of scientific data is in principle nothing more than a less cumbersome and more definitive form of hieroglyphics used in early communication. Briefly stated, as the human branch of the animal kingdom passed to the higher planes of civilization, the hieroglyphic system gradually blossomed into our present form of written, printed, and vocal expression of desires, thoughts, and accomplishments. Fortunately, the use of pictures, either as substitutes for, or adjuncts to, the written phase of civilized communication, has persisted through the ages. In the first decades of mechanical printing, the excessive cost of making "cuts," or their equivalents, limited the use of this mode of the portrayal of events, a fact particularly emphasized in the printed volumes dealing with natural philosophy. Fortunately, the art of printing was then a laborious procedure, otherwise this lack of picture portrayal would have been compensated by the modern undefiled and unctuous verbosity.

Descartes designed the present system of coordinate representation for the use of the geometricians, but never dreamed of the extensive use to which it would be put in the modern educational endeavors. We are living in a somewhat material world, one in which a constant attempt is being made to visualize our thoughts. Visual education is a part of the present-day program for the impartation of knowledge.

For the last half century, related quantitative facts have been rapidly accumulated in the field of chemistry and the chemist is making generous use of the Cartesian system in the presentation and study of these facts. In quite recent years the directors of many scientific publications have insisted that data be graphically represented if at all possible, thereby enabling the inclusion of more investigations without an increase in financial cost to the society member.

The teacher of general chemistry is keeping in the vanguard in the recognition of the value of coordination, in presenting his subject. He has constant recourse to this method in the discussion of the effect of pressure and temperature on solubility; the effect of temperature and dilution on conductivity; transition points and phase-rule studies in general; the properties—that is, hardness, compressibility, boiling point, freezing point, atomic volume—in relation to the atomic number of the elements; radioactive time transformations; atomic structure, and the flowsheets showing the steps involved in the preparation and manufacture of the elements and their compounds from the naturally occurring substances.

It must be admitted, however, that quite a few authors of chemistry texts and laboratory manuals have departed appreciably from the employment of graphics in their works. This is particularly true in the case of the latter type of book, in the face of the fact that a laboratory guide should, with a minimum amount of descriptive matter, instruct the student on the construction of the required apparatus and the manipulation involved in the conductance of an exercise. The modern architect presents the lay-out of a large building by means of a rather small number of ground plans and detail drawings. The chemist might well follow his example. We, of the Division of General Chemistry of the Ohio State University, are quite convinced from our experiences that the student is able to set up rather complex apparatus in a much shorter time and also to present more acceptable equipment, when following the detailed working-drawing with a minimum of descriptive matter.

MEASUREMENT OF CHEMICAL APTITUDE AND ATTAINMENT OF FRESHMEN IN AMERICAN COLLEGES

JACOB CORNOG
University of Iowa

As a teacher of elementary chemistry I have met the old problem of fitting subject-matter to the needs and capacities of the students. While the composition of textbooks and the technique of teaching have rightfully received much attention, little attention has been given to the equally basic factor of the learning capacity of students. Although this capacity is admittedly somewhat intangible and indeterminate, Dr. Stoddard, a psychological collaborator, and I have set up tests—the Iowa Chemistry Placement Examinations—which attempt to measure this capacity in Freshmen the first day they come to class at the beginning of the academic year. A description of these tests and a display of results obtained from their use have already been published in the *Journal of Chemical Education.*[1] I shall attempt to present some of these data, as well as some summarized conclusions arising therefrom. Further, I shall attempt to discuss some of the aspects of the teaching of elementary chemistry which the study of these data has suggested to me. My general thesis is that a wide difference exists in the capacity of students to learn chemistry. Also, there is a wide difference in the amount and difficultness of chemical subject-matter which is offered. Further, there is need for a quantitative determination of these two things as well as a better definition of what final examinations measure and what chemical credits mean.

As a starting point for our thinking, I wish to present data that give an idea of the capacity of Freshmen, who did not have high-school chemistry, to succeed in learning college chemistry. Other data are offered showing the kind and quantity of chemistry retained by Freshmen who have had courses in high-school chemistry. These data were obtained by the use of the Iowa Chemistry Aptitude and the Iowa Chemistry Training Tests, in 1925-1926, and represent

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[1] Cornog, J., and Stoddard, G. D. "Predicting Performance in Chemistry," *Journal of Chemical Education,* 2:701-8, August, 1925, and 3: 1408-15, December, 1926.

TABLE I

Institutional Averages, Iowa Chemistry Aptitude Examination, Revised, Fall, 1925[a]

Name of College (1)	Number (2)	Mean (3)	Median (4)	Upper Quartile[b] (5)	Lower Quartile[c] (6)	SD[d] (7)
University of California	640	65.4	67.2	78.1	54.0	17.5
Case School of Applied Science..............	182	73.7	76.5	84.8	64.4	15.1
Earlham College........	64	52.6	52.8	63.5	40.5	15.8
Eureka College........	32	42.9	43.6	49.1	34.1	12.6
Graceland College.......	28	66.4	67.3	82.1	57.3	19.8
Greensboro College.....	80	34.8	32.9	43.2	24.0	14.8
University of Iowa......	356	47.4	46.7	58.5	34.9	17.4
Kansas State Agricultural College.........	85	59.7	60.4	71.3	44.7	17.1
University of Minnesota	335	67.4	68.5	78.9	56.5	15.8
Missouri School of Mines	124	58.8	60.9	69.1	48.0	15.6
Missouri Wesleyan College..............	38	48.5	45.8	63.0	36.2	16.1
Montana State College..	116	64.4	64.0	73.1	55.5	14.2
University of New Mexico..............	37	41.2	42.6	45.9	37.6	6.4
University of North Carolina.............	70	63.0	64.6	76.7	48.3	18.7
University of Oregon...	189	55.1	53.3	69.6	43.0	19.6
Rutgers University.....	65	77.3	79.4	87.8	67.6	13.1
Santa Barbara Teachers' College..........	16	69.3	75.0	82.5	60.0	16.5
Utah Agricultural College..............	123	44.9	44.2	56.5	31.4	17.3
University of Washington...............	144	70.2	71.2	85.5	60.4	18.1
University of Wyoming.	33	60.3	63.1	77.1	45.6	19.9
Composite of all Colleges (18)..........	....	58.6	59.9	73.7	43.6	20.1

[a] Perfect score, 115; N = 2,032.

[b] The score above which are 25 percent of the group tested.

[c] The score below which are 25 percent of the group tested.

[d] Standard deviation (root mean square of deviations from the mean).

a sampling of some fifteen thousand students in more than fifty American colleges and universities. As most of these data have already been published in the *Journal of Chemical Education*,[2] I offer here only the tables and general conclusions. The data in Table I indicate that the capacity of Freshmen, who never had high-school chemistry, to get college chemistry is much the same in different parts of the country and in different institutions.

TABLE II

INSTITUTIONAL AVERAGES, IOWA CHEMISTRY TRAINING EXAMINATION CT-1, REVISED[a]

Name of College	Number	Mean	Median	Upper Quartile	Lower Quartile	SD
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Polytechnic Institute of Brooklyn.............	61	84.5	79.0	99.1	64.1	29.2
Case School of Applied Science..............	182	89.2	89.9	114.5	63.1	34.7
University of Cincinnati	77	94.3	99.1	119.1	79.0	30.5
Earlham College........	23	63.2	55.7	82.0	44.0	27.5
Greensboro College.....	10	31.5	29.1	37.0	17.8	20.0
University of Iowa.....	77	54.7	49.0	69.2	37.1	27.9
Kansas State Agricultural College.........	88	44.3	39.0	56.1	28.5	25.9
University of Minnesota	337	65.4	62.3	89.4	38.1	35.1
Montana State College..	66	47.0	45.4	54.7	37.1	13.5
University of North Carolina.............	30	66.5	65.0	83.3	50.0	23.4
Rutgers University.....	67	90.3	94.5	116.0	82.6	25.1
Santa Barbara Teachers' College..........	16	70.1	64.5	79.5	47.5	26.2
Utah Agricultural College..............	68	67.1	63.7	85.5	50.1	26.1
University of Washington...............	142	69.7	73.8	94.3	39.0	34.9
Composite of all colleges (12)..........	....	72.9	70.7	97.1	46.5	34.8

[a] Perfect score, 188; highest individual score, 160; N = 1,140.

Table II affords an index of the thoroughness of the chemical training given by high schools to the students in the various groups represented. A study of this table reveals the fact that, in any column in the table representing average group scores, the highest value is just about double the lowest.

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[2] *Loc. cit.*

Since these data purport to be an index of the capacity of the student to succeed in his subsequent chemistry course, a proper question is "How well does the placement of students by the placement examinations agree with the placement of the same students as determined by the final chemistry grades for the first semester in college?" Tables III and IV attempt to answer this question, both for the aptitude and the training tests.

TABLE III

Accuracy of Placement by the Iowa Chemistry Aptitude Examination

Quarter (1)	A or B (2)	C or D (3)	Total Pass (4)	Non-Pass (5)
First[a]	.51	.44	.95	.05
Second	.29	.61	.90	.10
Third	.10	.76	.86	.14
Fourth[b]	.01	.59	.60	.40

[a] Highest.

[b] Lowest.

The data given in Table III were obtained from examinations given at the Case School of Applied Science, Missouri School of Mines, Montana State College, Utah Agricultural College, and the University of North Carolina. The total number of students included was 933. The table indicates that 51 percent of the students in the upper quarter, made A or B, 44 percent made C or D, 95 percent of the upper quarter passed, and 5 percent of the upper quarter failed to pass. In the same table, the last line indicates that in the lowest quarter one percent of the students made A or B, 59 percent made C or D, 60 percent passed, and 40 percent failed to pass.

The composition of Table IV follows that of Table III except that it is based on results obtained from the test scores of 444 students who offered entrance credit in high-school chemistry at Case School of Applied Science, the University of Minnesota, Montana State College, and the University of North Carolina.

TABLE IV

ACCURACY OF PLACEMENT BY THE CHEMISTRY TRAINING EXAMINATION

Quarter (1)	A or B (2)	C or D (3)	Total Pass (4)	Non-Pass (5)
First[a]	.66	.33	.99	.01
Second	.31	.62	.93	.07
Third	.23	.50	.73	.27
Fourth[b]	.20	.52	.72	.28

[a] Highest.
[b] Lowest.

Better placement of students who offer entrance credit in chemistry may be obtained by giving both the Aptitude and Training Tests and then combining the scores. This was done with 166 students at the Case School of Applied Science. Table V is based on the results obtained at that institution.

TABLE V

ACCURACY OF PLACEMENT BY BOTH CHEMISTRY APTITUDE AND CHEMISTRY TRAINING EXAMINATIONS

Quarter (1)	A or B (2)	C or D (3)	Total Pass (4)	Non-Pass (5)
First[a]	.67	.33	1.00	....
Second	.35	.51	.86	.14
Third	.24	.39	.63	.37
Fourth[b]	.02	.45	.47	.53

[a] Highest.
[b] Lowest.

The tables give a fair notion of what may be expected from the use of chemistry placement examinations, that is, a notable scholastic superiority of the upper quarter, scholastic inferiority of the lowest quarter, and moderately successful accomplishment for those standing in the middle 50 percent of placement performance.

Table VI shows something of the kind and limitations of the chemical knowledge gained by students in high schools. It gives the distribution of scores made in each of the four parts of the examination. The Freshmen who made these scores number 712, and were located at the University of Cincinnati, the State University of Iowa, Kansas State College, the University of Minnesota, Montana State College, and Rutgers University.

TABLE VI

Distribution of Scores Made on Each of the Four Parts of the Chemistry Training Examination

Scores (1)	Descriptive Chemistry (2)	Formulas and Equations (3)	Industry and Daily Life (4)	Chemical Arithmetic (5)
0-5	.088	.229	.172	.223
6-11	.131	.139	.235	.166
12-17	.213	.167	.254	.288
18-23	.211	.180	.168	.095
24-29	.147	.124	.097	.150
30-35	.134	.117	.052	.039
36-41	.067	.028	.018	.032
42-45	.005	.013	....	.004
Perfect	45	45	50	48

Reading down Column 5, the figures signify that 22.3 percent of the 712 Freshmen made scores ranging from 0 to 5 on this part of the examination; 16.6 percent of the whole group similarly made scores ranging from 6 to 11, and so on down the column. The data in Table VI are graphically shown in Figure 1.

A glance at the curves in Figure 1 indicates unmistakably that a large proportion of the students did rather poorly in answering the questions in the Placement Examination. This showing may be attributed either to extreme difficulty of the examination, poor high-school preparation in chemistry, or to subject-matter covered by high-school chemistry not being the same as that covered by the Placement Examination. The following answer count is presented in order to throw light on the choice of alternatives.

	Percent Answering Correctly
Example 1. (True or false) Nitrogen is an active element. Right 353; wrong 149; omitted 27	66.7
Example 2. Complete and balance $KOH + HCl$. Right 365; wrong 44; omitted 120	69.0
Example 3. Complete and balance $Al\ (OH)_3 +$ H_2SO_4. Right 89; wrong 187; omitted 886	19.3
Example 4. 7 g. of iron unite with 5 g. of sulphur. How many grams of iron sulfide will be produced? Right 363; wrong 57; omitted 109	69.6
Example 5. The atomic weight of H is 1; of Cl, 35.5; of Zn. 65. What weight of Zn will be needed to generate 10 g. of H_2 using dilute HCl? Right 89; wrong 114; omitted 326	16.8

Summarizing all the data given, we would conclude the following:

1. Native chemical ability among Freshmen who took no chemistry in high school is much the same the country over.

2. The chemical attainment of students who have had chemistry in high school varies widely. From 20 to 40 percent of the students who offer college entrance credit in chemistry know nothing more of the subject than students who never have studied chemistry.

3. The best performance is in pure memory. Reasoning capacity is often not discernible. There is often displayed an inability to transfer the skills and experience of one situation to another similar situation.

So far as credence may be given the foregoing data and conclusions they represent a grave situation. We may well raise the question of "What is the profit in teaching chemistry when at the end of a year's training 21 percent of the students are unable to complete and balance $KOH + HCl$ and only one student in five can complete and balance $Al\,(OH)_2 + H_2SO_4$?" Nor, in my opinion, are such conditions restricted to chemical instruction in high schools. I have reason to believe that many Freshmen receive college credit in chemistry who are just as void of any understanding of the subject. The matter of teaching elementary chemistry is in somewhat of a mess. I have been trying to think why conditions exist as we now find them. The following considerations seem to me to be pertinent to the whole situation.

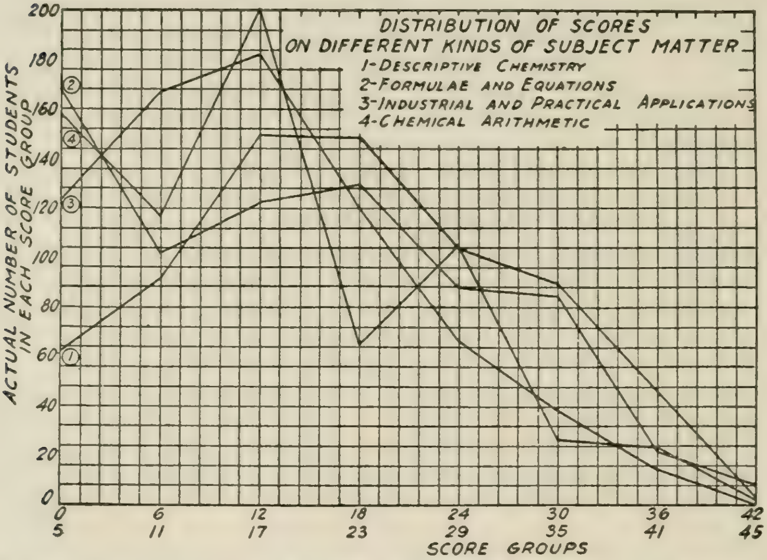

Figure 1.—Distribution of scores on different kinds of subject-matter.

1. There has been a great extension of chemical knowledge in the last few decades. This is indicated by the fact that the number of chemical researches recorded by the German *Zentralblatt* increased 240 percent between 1900 and 1925. The number of researches recorded in *Chemical Abstracts* increased 310 percent between 1907 and 1925. This extension of chemical knowledge has been reflected in

the increasing size of our chemistry textbooks, as is indicated in Figure 2.

The data presented in Figure 2 are only roughly approximate, but they are sufficiently accurate to indicate the sheer bulk of subject-matter that may now be offered beginners. Many textbook writers are anxious to add the new while reluctant to bury the old. But, the offering of a body of subject-matter far in excess of the student's capacity to receive would certainly tend to a superficial knowledge of the subject at the conclusion of the course.

2. The increase in the number of students going to school has had a profound influence on our educational methods and objectives—in chemistry and in other departments. The number of students in American colleges has increased fivefold in the past decade. Some idea of the influence exerted by this increment may be gained from Figure 3, which is taken from *The Junior College*, by L. V. Koos. The heavy line in Figure 3 indicates the distribution of scores made on the Army Alpha test by fifty thousand white men in the Army draft. It indicates the distribution of intelligence in a cross section of the whole male population of college age. The dotted line indicates the distribution of scores made on the same test by all the Freshmen who entered the University of Minnesota during two years. Broadly speaking, it may be said that college intelligence begins where that of the whole population leaves off. When it is recalled that only about half the students who entered this university as Freshmen survived at the end of two years it is easily seen that the average intelligence of college

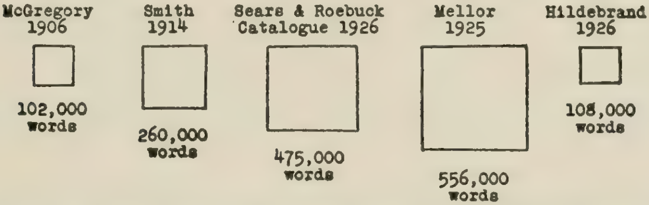

Figure 2.—A comparison of the number of words in different books.

students is far in advance of the average intelligence of that of the entire population of college age. It thus follows that as more and more of the entire population of college age go to college the average intelligence of the college population must approximate that of the whole population. With increasing student bodies we have decreasing capacity to learn. These considerations must apply with even greater force to the high-school population of the country.

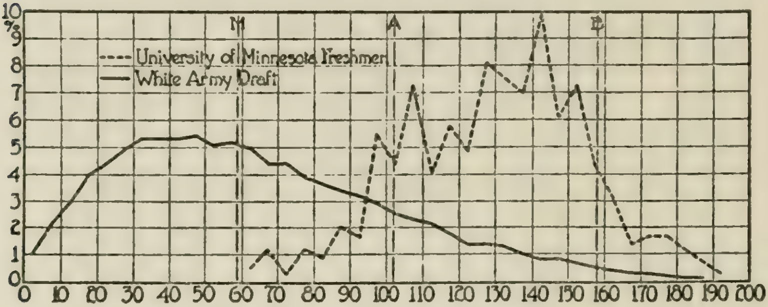

Figure 3.—Percentage distribution of Alpha scores of 344 Freshmen in the College of Science, Literature, and the Arts of the University of Minnesota and of 51,620 men in the white army draft (Lines A and B divide the middle group of Minnesota Freshmen from the low group at the left and the high group at the right. Line M indicates the median of the white army draft).

From this we should not conclude that the superior students of today are less numerous or inferior to the superior students of yesterday, but we cannot avoid the conclusion that they constitute a smaller fraction of the entire student body.

Further light on the situation as a whole is gained when we try to learn why the number of students attending our educational institutions has increased so greatly. Widespread material prosperity has made child labor less and less necessary to insure the food supply of the family. Parents confronted with the problem of what to do with their children when they no longer went to the factory, have sent them to school. A large proportion of these children lack both ability and desire for learning. Indeed, many are lazy and antagonistic toward the whole educational program. As a result of the influx of these large numbers of mediocre students, the school system was suddenly and without warning called upon to "do something" beneficent and beneficial for large numbers of students who lacked the desire and capacity to do much for themselves. This was and is a hard job. Considering the circumstances, the school system has met the situation remarkably well. I believe, however, those most intimately identified with the school system as it exists are not entirely satisfied with the present status. The following are some of the results with which I am dissatisfied.

First, there has been a softening of the subject-matter of old courses. As an example, compare an algebra text intended for Freshmen of today with one used by Freshmen ten or twenty years ago.

Second, the presence of so many indifferent students requires that the attention of college and school administrative officers be given almost entirely to discipline and not at all to the promotion of research, better scholarship, or consideration of the larger welfare of education. When school executives get together you will note that the chief subject of their conversation is recalcitrant cases of discipline.

Third, the presence of large numbers of students unable to learn or understand mathematics, history in its larger aspects, and languages and sciences other than those of a purely descriptive kind, has led to the introduction of a large number of moron-proof subjects such as manual training, bookkeeping, sewing, cooking, and the like. No less than twenty-one of the thirty-one divisions of this Educational Conference are given either to the operation of the educational machine or to these mechanical subjects.

Fourth, there has been the rise of athletics and other activities. These make an appeal to the intellectually indigent. I know of schools where credit toward graduation is allowed for playing in the band or on the athletic teams. I know of school executives who claim activities have greater value than the study of subjects such as the sciences and history.

Fifth, because of the crowded conditions of our schools the minimum passing requirement for grades or courses is often almost an imaginary quantity. Students gain promotion, academic credit, and even academic degrees by the process of outwaiting the teacher. Time, and not increased enlightenment, has, in large degree, become the stuff from which many educations are fashioned.

This conflict and confusion of value as it exists in the public mind may be illustrated by several anecdotes. I know a boy who last fall entered our local high school as a Freshman. He had the option of taking Latin or manual training. He would receive equal credit and social merit from taking either one. As manual training was easier and required less effort he preferred it. Only a short time ago our newspapers bore, in the same issue, the obituaries of Valentino, the movie actor of doubtful morals and questionable intellect, and that of Eliot, former President of Harvard University and undoubtedly one of the most valuable servants of society of his time. You recall that Valentino's obituary occupied most of the first page, while Eliot's received about a half column on page six. Last September, while traveling on a train out of Chicago, I had as my seat-mate a young man just off the farm who was going away to college. He seemed to be a boy of good qualities and potential capacity. I learned he planned to attend a certain "college" of chiropractics located within a thousand miles of Chicago. I tried to show him that he would do better to come to the University of Iowa and spend the necessary seven or eight years required to become a real doctor. His reply in substance was "What is the use? To become a doctor of chiropractics will not cost so much, will not take so long, will not require such hard work, will pay just as well financially after I graduate, and the public will call me doctor, just as if I were a real doctor."

I hope you will not think that I am of the opinion that activities and mechanical subjects are without value and unworthy of a place in our educational system. On the contrary, I believe that I fully appreciate their importance.

Both the president and the janitors are indispensible in the operation of this University, but they are not accorded equal merit either in the eyes of society or on the payroll. Similarly, I am willing to admit that the facts that Priestly discovered oxygen in 1774, that oxygen may be prepared by heating potassium chlorate, that hydrogen sulfide has a bad odor, and that ether is useful for removing grease stains from fabrics are all chemical facts of importance and value, but I am unwilling to admit they are on a par with the law of mass action, the periodic law, or the second law of thermodynamics. Further, I believe that as scientists and teachers, we are conniving at intellectual dishonesty when we give equal credit to examination questions such as "Name the halogens and describe their properties," and "Why is barium carbonate soluble in dilute hydrochloric acid while barium sulfate is not soluble in dilute hydrochloric acid?" Yet, most of us are doing just this sort of thing. Do we not in writing final examination questions generally put in enough questions of the first type so that we think most of the class will get a passing mark, and then enough of the second type so that students who have intellectual quality can demonstrate that quality? In doing this do we not put a subsidy on stupidity and a handicap on superior intelligence?

We may well ask, "What do final examinations measure and what do chemistry credits mean?" In my humble opinion the chief factor, about which the entire situation centers itself, is: How much value and social merit are we going to place upon the capacity of the human mind to think in generalized, and often symbolized and involved, abstractions as compared with a capacity that is limited to the consideration of only one concrete and tangible idea at a time, and largely lacks the ability to reason from cause to effect or from the experiences of one simple situation to another similar situation? It is fitting and important that we should ask and try to reach a conclusion on the question of whether there is greater merit and social value in such mental exercises as Faraday's recognition of the laws of magnetism than in the attainment of a thrilling pose before the motion picture camera or the building of a brick wall. Having reached a conclusion, let us act upon it.

A NATIONAL INSTITUTE FOR CHEMICAL EDUCATION

Neil E. Gordon

Editor, Journal of Chemical Education, University of Maryland

Before presenting the plan and purpose of a National Institute for Chemical Education, let us consider its foundation—the teaching profession in chemistry. The question is, "Do we have a teaching profession as applied to chemistry? Do men and women take up the study of chemistry with a view to making the teaching of chemistry their life work?" A few years ago one would have answered this question negatively, but not so today. A careful survey shows an increasing number of students who are professionally preparing themselves for the teaching of chemistry. Many of these young people have their eyes fixed upon the colleges rather than upon the high schools. The high schools must not be neglected, however, for the teaching of chemistry in high schools is probably more important than the teaching of chemistry in colleges.

It has been estimated that at least 80 percent of the boys and girls who have chosen chemistry as a life work have made such decisions before they left the high-school laboratories. Furthermore, the thousands who do not go to college, but who make up the major part of our public, have their attitude toward chemistry fixed by the chemistry teacher in the high school. Shall we not conclude then that the selection and training of high-school chemistry teachers are of prime importance?

The college teacher does little toward determining the number entering the field, but does help to determine their quality by a weeding-out process. The college teacher does a most important piece of work in giving the proper chemical education to those boys and girls who go out to advance science and also to those who are pursuing medicine, agriculture, pharmacy, engineering, and other branches of science which are so dependent on chemistry for their advancement. Furthermore, there is a large number of college men and women who take one or two years of chemistry and later hold influential positions in business. The attitude which they take toward chemistry through the remainder of their lives is determined by the college teachers.

The importance of the teacher to the advancement of our science is becoming more and more evident to the chemist. We should establish a national program commensurate with the importance of our work and with the purpose of making the teaching of chemistry a real profession. This will not be accomplished by the hit-and-miss plan which is now in vogue. Few great things have just happened. There must be a plan even though it may be imperfect. A theory in chemistry is nothing more than a plan. Just as one follows a chemical theory or plan until he finds something better, so in chemical education we must formulate a plan which is in keeping with our vision and then change that plan as time and occasion demand.

If we want a profession we must prepare men with a definite curriculum to serve their needs just as the physician or lawyer is prepared for his work under definite curricula.

There was a time when the chemists believed that the chemistry teacher's only qualification was to know chemistry, and when pedagogues believed that a knowledge of chemistry was a minor matter but that the method of presentation was the most important thing. Today there is a growing feeling that both are wrong. The chemist and pedagogue must work together to achieve the maximum results. In accordance, therefore, with action taken by the Division of Chemical Education of the American Chemical Society the curriculum in Table I is suggested for the preparation of high-school chemistry teachers.

This broad science-mathematical curriculum is suggested, for the average high-school teacher must teach, in addition to chemistry, other sciences or mathematics, or both. A sufficient number of hours of chemistry are included in order that the teacher will not only be well grounded in his major subject, but have enough work in chemistry to go ahead toward an advanced degree if he so desires, without making up undergraduate work as is usually necessary in such cases. The average amount of education required by

TABLE I

CURRICULUM FOR PREPARATION OF HIGH-SCHOOL CHEMISTRY TEACHERS

Subjects	Semester I	Semester II
FRESHMAN YEAR		
Composition and rhetoric	3	3
Modern language	4	4
Mathematics	3	3
General chemistry	4	4
Educational guidance	1	1
Basic R. O. T. C.	1	1
Library methods	1	....
Total credit hours	17	16
SOPHOMORE YEAR		
Public speaking	1	1
Qualitative analysis	4	4
Mathematics	3	3
General zoology	3	....
Chemical education	1	1
Botany	....	3
Public education in the United States	2	....
Educational hygiene	....	2
Basic R. O. T. C.	2	2
Total credit hours	16	16
JUNIOR YEAR		
Public speaking	1	1
Advanced composition and rhetoric	2	2
Organic chemistry	4	4
Quantitative analysis	4	4
Chemical calculations	1	1
Educational psychology	3	....
Technique of teaching	....	3
Total credit hours	15	15
SENIOR YEAR		
Physics	4	4
Physical chemistry	4	4
Industrial chemistry	3	3
Seminar	1	1
Special methods and supervised teaching	3	3
Principles of secondary education	....	3
Total credit hours	15	18

different states and about the amount necessary to give the teacher the proper perspective for the teaching profession is included. The requirement of ten hours of English needs no explanation. The only regret is that there is not room for more. It is also to be regretted that there is not more time for cultural subjects, but these are more easily added after leaving college than are the basic courses. In fact, most cultural subjects may be obtained by mere reading while it is practically impossible for the basic courses to be thus acquired.

As a rule, a well-prepared high-school chemistry teacher would either pass to a larger high school where the remuneration is comparable to that of a college position or go into administrative work or take graduate work in preparation for college teaching. The teacher who takes the course outlined is well prepared for either of the first two positions, and has the necessary foundation for going into the last named position. If he chooses the latter he will take no further work in pedagogy but devote his entire time to the pure science. No better college teacher could be wished than a man who has chosen chemistry teaching as his life work and followed the curriculum thus far described. He understands the students, he appreciates the environment from which they have come, and he has his high-school experience and training supplemented by three years of study in the pure science where he has been given not only a thorough knowledge of a great science but a mastery of the research methods by which new knowledge is found.

Our universities should furnish curricula similar to the one given above and some university in each state. Perhaps the state university should see that enough men and women are trained in chemistry to meet the needs of the high schools in that particular state. This does not mean that all teachers prepared in a given state would teach in that state; but it does mean that, if each state prepared its state quota, there should be sufficient well-prepared men and women to fill all the positions in the United States. If this were done we would not need to worry about the college positions. Enough of these men would study for the higher degrees to man our college positions. The college positions would be an outlook and outlet for our best men.

Next we need a national institute to promote the profession of chemical education. This national institute would have for its purpose keeping the chemistry teacher, whether in high school, college, or university, up to date in his profession as regards both content and method. This could be accomplished through five departments: graduate, industrial, historical, college, and high school. The function of the first three departments would be to transfer new material from the frontier fields back to the teachers after a process of sifting and sorting, thereby furnishing the teacher with authentic material from which to choose the content of his course. When these new theories and applications are introduced, room must be made for them in the curriculum by the elimination of obsolete and less important material, the men in the first three departments helping in this process. The college and high-school departments would work out apparatus and methods by which to present this new material.

The heads of these five departments, in addition to carrying on this new type of research, would give approximately two lectures each week embodying the new material obtained. This would furnish excellent courses for students interested in the teaching of chemistry, as well as attract teachers from all over the world. At the institute a teacher should be able to acquire in the least possible time the latest authentic theories and applications in chemistry.

Special courses would be offered at vacation periods, especially during the summer, when national and international authorities, both in the pure and applied field, would be brought in addition to the regular men at the institute. It would be the great camping ground for the teachers in summer. The gist of the institute idea is given in the *Journal of Chemical education.*[1]

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[1] Gordon, Neil E. "A Research Institute for Chemical Education," *Journal of Chemical Education*, 4:110-14, January, 1927.

RECENT ETHER-DRIFT EXPERIMENTS AND THEIR INTERPRETATION

DAYTON C. MILLER
Case School of Applied Science

The general acceptance of the theory that light consists of wave motion in a luminiferous ether made it necessary to determine the essential properties of the ether which will enable it to transmit the waves of light and to account for optical phenomena in general. Several physicists have sought to prove the existence of the stationary ether by direct experiment. The most fundamental of such proposals was that of Professor A. A. Michelson, made in 1881, based upon the idea that the ether as a whole is at rest and that light waves are propagated in the free ether in any direction and always with the same velocity with respect to the ether. It was also assumed that the earth in its orbital motion around the sun passes freely through this ether as though the latter was absolutely stationary in space. The experiment proposed to detect a relative motion between the earth and the ether, and it is this relative motion which is often referred to as "ether-drift." A remarkable instrument known as the "interferometer," which had been invented by Professor Michelson, is capable of detecting a change in the velocity of light of the small amount involved in ether-drift.

In the year 1887, at Case School of Applied Science, in Cleveland, Professor Michelson, in collaboration with the late Professor Edward W. Morley of Western Reserve University, made certain important developments of method and apparatus and used the interferometer in the now famous "Michelson-Morley Experiment," in an effort to determine whether the motion of the earth through space produces the effect upon the velocity of light as predicted by theory. In November, 1887, they announced their conclusions as follows:

> Considering the motion of the earth in its orbit only . . . the observations show that the relative motion of the earth and the ether is probably less than one-sixth of the earth's orbital velocity and certainly less than one-fourth.

The writer, in collaboration with Professor Morley, constructed an interferometer about four times as sensitive as the one used in the first experiment, having a light path of 214 feet, equal to about 130 million wave lengths. Observations were made in the years 1902 to 1906. It was at this time that Einstein became interested; and in November, 1905, he published a paper on "The Electrodynamics of Moving Bodies." This was the first of a long series of papers and treatises by Einstein and others, which has developed into the present theory of relativity. In this first paper, Einstein states the principle of the constancy of the velocity of light, postulating that for an observer on the moving earth the measured velocity of light must be constant, regardless of the direction or amount of the earth's motion. The whole theory was related to physical phenomena, largely on the assumption that the ether-drift experiments of Michelson, Morley, and Miller had given a definite and exact null result.

The site of the Mount Wilson Observatory, near Pasadena, California, at an elevation of about six thousand feet, appeared to be a suitable place for further trials. The complete study of the ether-drift experiments at Mount Wilson, in the years from 1921 to 1926, leads to the conclusion that there is a systematic displacement of the interference fringes of the interferometer corresponding to a constant relative motion of the earth and the ether at this observatory of ten kilometers per second; and that the variations in the direction and magnitude of the indicated motion are exactly such as would be produced by a constant motion of the solar system in space, with a velocity of two hundred kilometers, or more, per second, toward an apex in the constellation Drace, near the pole of the elliptic, which has a right ascension of 255 degrees and a declination of 468 degrees.

RECENTLY DISCOVERED ELEMENTS

B. S. Hopkins
University of Illinois

The search for new elements has always been an alluring task for the chemist. It is probable that early discoveries did not result from a deliberately determined search because there were no theories which could be used to predict the existence of unknown elements, much less to foretell where they might be found or how they might be separated or identified. As a consequence the early discoveries were usually made as the result of work which was undertaken for some purpose other than the discovery of a new element. In the pursuit of problems of this nature it happened occasionally that there was encountered material with properties which differed from those already known. If the investigator followed up these strange properties and found that he could separate from his known material a new substance to which the new properties could be ascribed, he usually concluded that he had discovered a new element. Frequently this conclusion was wrong, but sometimes it was right, although it usually required years of hard work to establish the fact definitely. When the number of unknown elements was large and their distribution in nature was abundant, the chance of discovering an element by accident was relatively good. As discoveries increased in number and as it became evident that the unknown members of the family of elements were few in number and small in amount, chance discoveries became much less probable. Fortunately as this fact became more and more evident, the chemist was furnished with theories by which he was definitely guided in his search for new elements. According to present accepted theories, not only is there a rigid limit to the number of elements which are unknown, but the searcher after these unknowns is guided by well-defined theories and furnished with definite means of identification.

When Mendeléeff published his Periodic Table (see Figure 1) sixty-three distinct elements were recognized.[1]

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[1] Mendeléeff, D. *Annalen Suppl.* 8 151 (1872).

In order to locate each of these elements in related groups it was necessary to leave many blank spaces for elements at that time unknown. A study of Mendeléeff's table shows the presence of all the sixty-three elements together with thirty-one blank spaces, most of which were left for elements with atomic weights greater than that of cerium. From these facts it might be concluded that Mendeléeff definitely predicted the existence of ninety-four elements, a number which corresponds remarkably with our present belief. On examining Mendeléeff's table more closely we observe that he made no provision whatever for the zero group and certainly his method of distributing the rare earth group leaves much to be desired in the light of present-day information. Hence it is safe to assume that when this table was prepared little attention was devoted to the total number of elements.

Mendeléeff's blank spaces represented such definite realities in his mind that he ventured to predict the discovery of elements to fill these spaces and in certain cases he foretold the properties of the elements and their compounds. Within four years de Boisbaudran discovered gallium which corresponds with astonishing accuracy to the predictions made for eka-aluminum. Scandium, which had been predicted as ekaboron, was discovered in 1879 by Nilson, while Winkler in 1886 located ekasilicon and named it germanium. These three confirmations of Mendeléeff's predictions have done much to establish our faith in the Periodic Table and in the resultant study of the interrelationship of the elements.

In spite of our admiration for this remarkably clear conception concerning the periodicity shown by the elementary forms of matter, efforts to fill in the remaining blank spaces in the original Mendeléeff table are decidedly disappointing. In no case does a discovered element fulfill the predictions with the same startling accuracy as we find in the case of gallium, scandium, and germanium. The table runs with perfect smoothness until the rare earth group is encountered and then difficulties are experienced due to inaccurate atomic weights as well as the puzzling problem presented by a group of fifteen elements of like valence and strikingly similar properties. Most chemists of our day who have tried to solve the enigma of the rare earth group are led to a profound sympathy for Mendeléeff in his efforts to find a simple and satisfactory means of locating this group in any simple tabulation.

The period from 1871 to 1914 saw the discovery of three distinct groups of elements—the noble gases, radio-active elements, and many members of the rare earth group. In accordance with the information gained in this period, the Mendeléef table was modified, but still the rare earth group was a source of trouble. It was insisted that cerium, which shows a definite valence of four, must be placed in Group IV. This made necessary an awkward break in the sequence in order to get the other members of the rare earth group back into Group III where they obviously belonged. Following this group came tantalum, in Group V, which necessitated another puzzling irregularity in the omission of Group IV.

The year 1914 marks a distinct advance in the development of the Periodic Table, because in that year the work of Moseley made it possible to define with accuracy the position of any element in the table. This outstanding accomplishment also made it necessary to assume that from hydrogen to uranium there must be a total of ninety-two elements. Not only was the number of blank spaces definitely determined but the position of each was clearly shown. Accordingly, the investigator who was interested in completing the Periodic Table was led to search for a missing element in material containing a closely related element. In addition, the method of X-ray analysis has been of the greatest service because it permits the definite identification of an element by the determination of its atomic number through the wave length of its X-ray lines. From such considerations the chemist of 1914 who accepted the common belief in the existence of eighty-seven known elements was convinced that there must be five missing elements within the usual limits of the table. Three of the five unknown elements were in Group VII, No. 43, ekamanganese, No. 75 dwimanganese, and No. 85 eka-iodine. There still remained one undiscovered member of the rare earth group, No. 61, ekaneodymium, while the existence of No. 87, ekacaesium, has been suspected for many years.

The next important step in the completion of the Periodic Table came in the form of a simplification in the region of the rare earth group. In 1911 Urbain, working with the extreme soluble end of an extensive series from gadolinite, had isolated a few oily drops of mother liquor which refused to crystallize. Examination of this material by the aid of arc spectrum analysis revealed the presence of several lines of what appeared to be a new element. Evidence of the existence of this new element was also found in the fact that something gave this new substance a much lower magnetic susceptibility and a weaker basicity than either lutecium or ytterbium with which it was associated. Accordingly, Urbain assumed that these phenomena were due to the presence of a new rare earth to which the name celtium was assigned. In 1922 Dauvillier found in this material two extremely faint X-ray lines which correspond closely to the positions assigned to $L\beta_2$ and $L\alpha_1$ of element No. 72. Accordingly, Urbain argued that the identification of the element celtium, with the atomic No. 72, is complete.[2]

Mendeléeff's Table[1] *(1871)*

	I	II	III	IV	V	VI	VII	VIII
	—— R_2O	—— RO	—— $\cdot.R_2O_3$	RH_4 RO_2	RH_3 R_2O_5	RH_2 RO_3	RH R_2O_7	—— RO_4
1	H = 1							
2	Li = 7	Be = 9.4	B = 11	C = 12	N = 14	O = 16	F = 19	
3	Na = 23	Mg = 24	Al = 27.3	Si = 28	P = 31	S = 32	Cl = 35.5	
4	K = 39	Ca = 40	— = 44	Ti = 48	V = 51	Cr = 52	Mn = 55	Fe = 56, Co = 59 Ni = 59, Cu = 63
5	(Cu = 63)	Zn = 65	— = 68	— = 72	As = 75	Se = 78	Br = 80	
6	Rb = 85	Sr = 87	Y = 88	Zr = 90	Nb = 94	Mo = 96	— = 100	Ru = 104, Rh = 104 Pd = 106, Ag = 108
7	(Ag = 108)	Cd = 112	In = 113	Sn = 118	Sb = 122	Te = 125	I = 127	
8	Cs = 133	Ba = 137	Di = 138	Ce = 140	——	——	——	—— —— —— ——
9	(——)	——	——	——	——	——	——	
10	——	——	Er = 178	La = 180	Ta = 182	W = 184	——	Os = 195, Ir = 197 Pt = 198, Au = 199
11	(Au = 199)	Hg = 200	Tl = 204	Pb = 207	Bi = 208	——	——	
12	——	——	——	Th = 231	——	U = 240	——	—— —— —— ——

[1] *Annalen Suppl.* 8 151 (1872).

Figure 1.—Mendeléeff's Periodic Table.

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[2] Urbain, G. *Chemistry and Industry.* 42 764 (1923).

On the other hand, Coster and Hevesy, studying the probable atomic structure of element No. 72 in the light of the Bohr theory, reached the conclusion that this element cannot be a member of the rare earth group.[3] According to the Bohr theory, the presence in the Periodic Table of a group of similar elements with a uniform valence is to be accounted for by the addition of successive electrons to an inner shell, while the number of electrons in the outer shell, which determines the valence, remains unchanged. When electrons are added in the rare earth group all the inner shells become complete when element No. 71, lutecium, is reached. Consequently, the only possible way to form element No. 72 is to add the extra electron to the outer shell, which gives it a structure similar to zirconium and makes

Group	O	I	II	III	IV	V	VI	VII	VIII		
Type Formula		R_2O	RO	R_2O_3	RO_2 H_4R	R_2O_5 H_3R	RO_3 H_2R	R_2O_7 HR			
Series 1		H 1 1.008									
2	He 2 4.00	Li 3 6.94	Be 4 9.1	B 5 10.85	C 6 12.005	7 N 14.008	8 O 16	9 F 19.0			
3	Ne 10 20.2	Na 11 23.00	Mg 12 24.32	Al 13 26.97	Si 14 28.1	15 P 31.04	16 S 32.06	17 Cl 35.46			
4	A 18 39.9	K 19 39.10	Ca 20 40.07	Sc 21 45.1	Ti 22 48.1	V 23 51.0	Cr 24 52.0	Mn 25 54.93	Fe 26 55.84	Co 27 58.97	Ni 28 58.68
4a		29 Cu 63.57	30 Zn 65.37	31 Ga 70.1	32 Ge 72.5	33 As 74.96	34 Se 79.2	35 Br 79.92			
5	Kr 36 82.92	Rb 37 85.45	Sr 38 87.63	Y 39 89	Zr 40 90.6	Cb 41 93.1	Mo 42 96.0	Ma 43 ?	Ru 44 101.7	Rh 45 102.9	Pd 46 106.7
5a		47 Ag 107.88	48 Cd 112.40	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.5	53 I 126.92			
6	Xe 54 130.2	Cs 55 132.81	Ba 56 137.37	RARE 57-71 EARTHS	Ct-Hf 72 178.6	Ta 73 181.5	W 74 184.0	Re 75 ?	Os 76 190.9	Ir 77 193.1	Pt 78 195.2
6a		79 Au 197.2	80 Hg 200.6	81 Tl 204.0	82 Pb 207.2	83 Bi 209.0	84 Po 210	85			
7	Rn 86 222	87	Ra 88 226	Ac 89	Th 90 232.12	Pa 91	U 92 238.2				

RARE EARTHS	La 57 139.0	Ce 58 140.25	Pr 59 140.9	Nd 60 144.3	Il 61 146 ?	Sm 62 150.4	Eu 63 152.0
Gd 64 157.3	Tb 65 159.2	Dy 66 162.5	Ho 67 163.5	Er 68 167.7	Tm 69 168.5	Yb 70 173.5	Lu 71 175.0

Figure 2.—Periodic Table, 1926.

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[3] Hevesy, G. *Chemical Review.* *2* 1 (1925).

it a quadrivalent element. When these investigators examined samples of Norwegian zircon by the methods of X-ray analysis they were able to discover distinct lines in the exact positions predicted for α_1, α_2, β_1, β_2, β_3, and γ_1 of the L series of No. 72. They also announced the discovery of element No. 72 for which they have proposed the name Hafnium. A controversy immediately arose concerning the possible presence of this element in Urbain's material. It is to be hoped that the International Committee will decide the question upon its merits so that we are not compelled to add to our list another case of an element which is known by two different names. Before the decision is made in favor of Urbain, it seems necessary for someone to prove beyond the shadow of a doubt that element No. 72 is sometimes found in rare earth minerals, especially gadolinite of the type used by Urbain. If the decision is made in favor of Coster and Hevesy, it will be necessary for them to explain why it is that No. 72 is never found in rare earth minerals while its two closest relatives, zirconium and thorium, are very common stray components of rare earth minerals.

However this controversy is settled, certain it is that the Periodic Table is simplified by a recognition of the fact that No. 72 is a member of Group IV and closely related to zirconium and thorium (see Figure 2). By putting all members of the rare earth group from lanthanum to lutecium in one space, an arrangement is obtained which is as simple as could be expected.

Numerous efforts have been made to reveal the presence of ekamanganese. In fact, the discovery of this element, in confirmation of the predictions of Mendeléeff, was announced at least as early as 1908. This announcement failed of confirmation and element No. 43 continued to baffle the scientists of the world, until its discovery in Berlin early in 1925 by Noddack and Tacke.

In studying the probable occurence of elements Nos. 43 and 75, Noddack and Tacke reasoned that these two elements should be found together since nowhere in the Periodic Table do we have closer resemblances than between the corresponding members of Series 5 and 6.[4] As a consequence, elements 43 and 75 should be found in the same minerals. Moreover, these minerals need not necessarily be manganese ores since the elements in Series 4 are somewhat distinct from their relatives in Series 5. It was also argued that we should expect elements 43 and 75 to be found both in oxygen-containing ores like those of molybdenum, tungsten, columbium, and tantalum and also in the free state like the platinum metals. Noddack and Tacke reasoned extensively concerning the chemical properties which should distinguish elements 43 and 75 from their neighbors. In accordance with the conclusions reached in this way, several likely minerals were brought into solution by fusion, then subjected to H_2S treatment in such a manner as to separate 43 and 75 if they had the properties predicted for them. In this manner, a small quantity of material was obtained from columbite which, upon examination by X-ray spectrum analysis, revealed the α_1, α_2, and β_1 lines of the K series of element 43, and α_1, α_2, and β_1 of the L series of element 75. In similar manner, various platinum ores were heated alternately in hydrogen and in oxygen when a small sublimate was obtained whose behavior agreed with that predicted for elements 43 and 75. Although the amounts obtained are exceedingly small, the evidence seems good and thus we are permitted to add to the table the element masurium with atomic number 43 and the element rhenium, No. 75.

Loring and Druce, working in their London laboratory, have examined critically some manganese salts of commerce, and samples of commercial pyrolusite.[5] From solutions prepared from such material, manganese was removed by hydrogen sulfide and calcium was precipitated as the oxalate. From the filtrate there was precipitated, by means of ammonium hydroxide, a white flocculent substance which darkened on standing. When this material was subjected to X-ray examination, in the Hilger laboratory, lines were obtained which correspond nicely with the positions calculated for $L\alpha_1$ and $L\beta_1$ of element No. 75. The amount of this element varies in the different sources, but it is estimated that "pure" manganese sulfate contains about 1 percent of dwimanganese, some of whose chemical properties have been determined. These results have been confirmed by workers in the chemical laboratory of Charles University, Prague, who have suggested that the name dwimanganese be retained. Element No. 75 thus seems to be definitely established, since its presence has been shown by investigators in three laboratories.

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[4] Noddack, Walter, and Tacke, Ida. *Naturwiss.* *26* 567 (1925).

[5] Loring, F. H. and Druce, J. G. F. *Nature.* *116* 782 (1925); January 30, 1926, p. 159. *Chemical News.* *131* 273, 337 (1925).

By similar methods, Loring and Druce have examined exhaustively the residues obtained from pyrolusite and found some evidence for belief that they contain traces of eka-iodine (No. 85), ekacaesium (No. 87), and the element next beyond uranium which would have an atomic number of 93. The evidence is not completely convincing and the authors suggest that it must be interpreted as foreshadowing the existence of these three strangers in such material. Additional work is promised to assist in clearing up the questions which naturally arise concerning these elements.

Much more than usual interest has attached to the possible existence of element No. 87 which is known conveniently as ekacaesium. As long ago as 1902, Professor T. W. Richards and Dr. E. H. Archibald, at Harvard, searched diligently for ekacaesium in the mineral polucite.[6] In 1915, Professor G. P. Baxter continued this search in the same institution,[7] and, in 1919, Professor L. M. Dennis and Dr. R. W. G. Wyckoff, of Cornell University, attempted to find evidence of the presence of an alkali element whose atomic weight is greater than that of caesium.[8] All of these efforts failed to locate the missing element but this group of investigations stands out as a brilliant achievement, planned with unusual scientific skill and carried out with rare devotion and accuracy. Dr. Archibald is continuing the search with heroic devotion in spite of discouragements and it is to be sincerely hoped that his work will be rewarded by the discovery of this elusive stranger.

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[6] Richards, T. W., and Archibald, E. H. *Proceedings American Academy of Science.* *38* 449 (1903).

[7] Baxter, Gregory P. *Journal of the American Chemical Society* *37* 287 (1915).

[8] Dennis, L. M. and Wyckoff, R. W. G. *Journal of the American Chemical Society.* *42* 985 (1920).

If ekacaesium exists, it must be radio-active and the recent investigations of the peculiar radio-active properties of the alkali family only serve to revive our interest in this element. Professor Harkins, of Chicago, has reminded us that the elements beyond bismuth which have odd atomic numbers are short-lived.[9] It seems reasonable to conclude that both 85 and 87 may be elements with a very brief half-life period, or they may not exist at all. To those who pin their faith in the Periodic Table there remains a hope that this last and most trying test for Mendeléeff's extraordinary generalization may result in a completed table of 92 or more elementary forms of matter.

The most recent announcement of the isolation of a chemical element came in March, 1926, when the University of Illinois announced the discovery of the element illinium, as No. 61, the missing member of the rare earth group.[10] The discovery resulted from the work of this puzzling group of elements which had been in progress in the laboratory for about fifteen years, during five of which there was a definite search being made for the missing element.

Early in 1919 a cooperative plan was arranged between the Department of Chemistry of the University of Illinois and the United States Bureau of Standards for the mapping of the arc spectrum lines of certain rare elements, especially the members of the rare earth group. The University furnished samples from its collection and the Bureau made precision measurements of the lines in the red and infra-red regions of the spectrum. Under date of December 14, 1921, Dr. C. C. Kiess of the Bureau reported to the Department of chemistry as follows:

> I have about completed the work on neodymium and samarium. Both samples submitted by you seem to be very pure, with one exception. In the spectrum of each appear numerous faint lines of identical wave-length. So far I have been unable to identify them with the

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[9] Harkins, W. D. *Journal of the American Chemical Society.* *42* 1985 (1920).

[10] Harris, J. A., Yntema, L. F., and Hopkins, B. S. *Journal of the American Chemical Society.* *48* 1585, 1594 (1925).

> lines of known elements. It would be a hasty conclusion to announce that they belong to a new element but this idea should not be laid aside in view of the fact that the present acccepted scheme of the Periodic Table calls for an element (as yet unknown) of the order number, 61, between neodymium and samarium.

Following this suggestion, work was begun upon the concentration and identification of the substance which produced the unknown lines. Dr. L. F. Yntema, working as Fellow of the National Research Council, carried out an X-ray examination in the Sloane Laboratory of Physics at Yale, while fractionations were busy being continued in Urbana. The result of the two years' work was the addition of five arc spectrum lines toward the violet, and the conclusion that, if No. 61 were present at all, it must be in quantities of less than one part in a thousand.[11]

It was evident that some method of obtaining a greater concentration must be found before the identity of the element could be established. Previous attempts at concentration had been made by the fractional crystallization of the double magnesium nitrate. In such a series the elements arrange themselves in the order of increasing atomic numbers which would lead us to expect No. 61 to crystallize between neodymium and samarium. Since both of these elements are relatively abundant, it would not be surprising to find these more common elements completely obscuring an intervening element if it were present in very small proportions. Consequently, it seemed advisable to run a series using some other salt. Professor James has shown that the solubility of the bromates decreases from neodymium to samarium, reaches a minimum in europium, and then increases again in gadolinium and terbium.[12] As a result, these elements, when fractionated in a bromate series, do not arrange themselves in the order of atomic numbers, but europium appears at the least soluble end while neodymium is well out toward the more soluble end with terbium, gadolinium, and samarium distributed between.

When Dr. J. A. Harris fractionated some of our material as the bromate it was found that samarium was crystallizing out at the less soluble end, while neodymium was concentrating in the more soluble fractions. As the fractionation continued the characteristic absorption bands of both neodymium and samarium began to grow less evident in the middle fractions. Soon there was noticed at wavelength 5816A° a faint line which was growing stronger as the fractionation proceeded while the characteristic absorption lines of both neodymium and samarium were growing weaker. Later another line was detected at 5123A° whose intensity increased as the familiar absorption lines of neodymium and samarium were becoming more faint. These lines evidently belonged to a new element whose presence had been concealed by the broad and persistent absorption bands of neodymium and samarium. This unknown element we believe to be illinium since our theories lead us to expect that such an element should exist at this point. When a bromate series is examined, europium and samarium appear in the least soluble fractions followed in order by gadolinium, illinium, terbium, and neodymium. This order is especially fortunate for the detection of illinium by means of absorption spectra because it is separated from samarium by gadolinium and from neodymium by terbium. Since the absorption bands of gadolinium fall in the ultraviolet portion of the spectrum and terbium has only a single narrow line in the visible spectrum, this leaves almost an uninterrupted field for the detection of any new absorption lines, which might reveal the presence of a new element. As long as illinium remained associated with neodymium and samarium, its detection by absorption spectra was impossible. But as soon as it was sufficiently separated from these elements, the new absorption lines were quickly made out.

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[11] Yntema, L. F. *Journal of the American Chemical Society.* *46* 37 (1924).

[12] James, C., and Bissell, D. W. *Journal of the American Chemical Society.* *36* 2060 (1914).

When the most prominent absorption lines of the elements of the rare earth group are plotted according to their wave-lengths,[13] there is observed a drift in their positions which must be significant in dealing with atomic structures.

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[13] Yntema, L. F. *Journal of the American Chemical Society.* *48* 1598 (1926); Harris and Hopkins, ibid *48* 1593 (1926).

From elements 59 to 64 this drift is toward the shorter wave-length, the absorption bands of No. 64, gadolinium, being in the ultra-violet region. When the new lines at 5816A° and 5123A° are assigned to element No. 61, these lines fall into perfect accord with the drift in the lines of the neighboring elements.

In these days the identification of a new element is never complete without adequate measuremnts of its X-ray spectral lines and the determination of its atomic number. Accordingly, there was designed and built in our laboratory a glass X-ray tube equipment with water-cooled electrodes. The cathode was made of pure aluminium and the target of copper, the face being a plate with a depression in the center for holding the fused rare earth oxide. The usual voltage was about 30,000 with an average current of 8-10 milliamperes. The equipment could not be used with safety above 40,000 volts, consequently we were unable to study the K emission spectra but were limited to the L series. We found it necessary to use exposures of eight to sixteen hours and considerable difficulty was experienced in keeping our rare earth target in place during such a long exposure. By fusing the oxide into the depression on the plate which formed the face of the target, this difficulty was effectively overcome. Because of the skillful cooperation between our mechanician and our glassblower, we were able to obtain a perfect focus upon the rare earth button on the target, so that it was the only source of X-radiation. We were unable to get the copper lines on our plate for reference.

The crystal used in our work was calcite, three different crystals being used in order to avoid the effect of invisible defects. The rotation of the crystal was limited to thirty minutes because of the low energy input which we were compelled to use. The dispersion between $L\alpha_1$ and $L\alpha_2$ of samarium was 0.5 mm., the former line being our principal line of reference, but the deviation from the theoretical value of $L\alpha_1$ of 61 being checked against $L\alpha_2$ of samarium or $L\alpha_1$ of neodymium.

Five successful exposures were made for $L\alpha_1$ of element

No. 61, using two different fractions for the target. The lines obtained were faint, but in each case their positions were verified by several disinterested observers before the final reading was made. In every case the setting was made with the utmost care and after the reading had once been taken no re-reading of the line was permitted. The maximum deviation from the theoretical wave-length was less than 0.005A°, the average value for the five determinations differing by 0.0004A° from the Siegbahn calculated value. These deviations are well within the limits of error of measurement as shown by checking against the lines of samarium and neodymium.

A single determination of $L\beta_1$ of element 61 varies from the calculated value by 0.004A°. On our last plate there was a very faint line corresponding to $L\beta_3$ of No. 61, but since this was at the edge of the area of general radiation covered by the oscillation, it is not safe to accept it without confirmation. Other measurements of the lines of both the L series and of the K series will be made as soon as possible.

In order to make sure that the lines which we have measured are due to element No. 61 and not to some related element from our rare earth material, we have studied carefully all lines of the first, second, and third orders which are so situated that they might be mistaken for the lines of the missing element. Table I shows these lines, with the wave-lengths, the elements, and the series to which they are due. In addition, a study of the relative intensities of these lines shows that about the only possibilities of mistaken identity would be in the case of chromium, cerium, lanthanum, mercury, and bromine. Of these possibilities, chromium could scarcely be present because no compounds of this element were used in our work and chromium is not a common constituent of rare earth minerals. Both cerium and lanthanum were present in the minerals from which our materials were extracted but neither of these elements could have been present in our final samples because these were subjected to hundreds of fractionations after the last trace of the prominent praseodymium lines had disappeared and both cerium and lanthanum are farther removed from our materials than is praseodymium. The presence of mercury in our X-ray tube is scarcely possible because of the thorough evacuation and the presence at all times of a liquid air trap between the pump and the tube. The presence of silver bromide on our photographic plate makes the presence of bromine absorption line possible, and on our last plate we had a rather sharp edge of radiation close to the $L\beta_1$ line of 61 which might possibly be due to the second order of the K absorption limit for bromine. The fact that both lines were distinguishable makes it highly improbable that our line was confused with the bromine line.

TABLE I

LINES POSSIBLE IN THIS REGION OTHER THAN ELEMENT 61

Wave-length (1)	Element (2)	Series (3)		Wave-length (4)	Element (5)	Series (6)
2.270.......	La	$L\beta_7$	Lines of first order in this region			
2.273.......	Cr	$K\alpha_3$				
2.277.......	Ce	$L\beta_6$		2.067	Cr	$K\beta_2$
2.277.......	La	$L\beta_9$		2.072	Ba	$L\gamma_4$
2.280.......	Va	$K\beta_1$		2.082	Ho	$L\rho$
2.285.......	Cr	$K\alpha_1$		2.080	Cr	$K\beta_2$
2.285.......	La	$L\beta_{10}$				
2.285.......	Va	$K\beta^1$				
			Second order lines possible	1.030	Hg	$L\beta_3$
1.129.......	W	$L\gamma_5$		1.037	Tl	$L\beta_4$
1.133.......	Ir	$L\beta$		1.038	Hg	$L\beta_2$
1.135.......	Ta	$L\gamma_1$		1.038	As	$K\beta_2$
1.138.......	Ir	$L\beta_5$		1.038	Br	$K\alpha_2$
1.140.......	Pt	$L\beta_4$		1.308	Au	$L\beta_6$
				1.042	Br	$K\alpha_2$
0.745.......	U	$L\beta_4$	Third order	0.664	Cb	$K\beta_1$
0.749.......	Cb	$K\alpha_2$		0.688	Zr	$K\beta_2$
0.752.......	Th	$L\beta_8$		0.700	Zr	$K\beta_1$
2.277.......	61	$L\alpha_1$		2.073	61	$L\beta_1$

The evidence for the existence of a new element is based on three independent facts:

1. The presence in our neodymium-samarium fractions of arc spectrum lines of unknown origin. Of these the wave-lengths of 135 have already been measured.

2. The development of new absorptions bands in the fractions intermediate between neodymium and samarium; these bands become stronger as the familiar characteristic bands of neodymium and samarium are reduced in intensity through fractionation. Bands at 5816A° and 5123A° are evidently due to an intermediate element and the position of these bands confirms the conclusion that there is a regular shift in the absorption bands of the adjacent members of the rare earth group.

3. The identification in the X-ray emission spectra of lines corresponding closely with the theoretical positions for $L^{\alpha}{}_{1}$ and $L^{\beta}{}_{1}$ of element No. 61.

For the new element we propose the name Illinium, with symbol Il and an estimated atomic weight of approximately 146.

PARENT-TEACHER ASSOCIATION

MRS. C. M. VALENTINE, *Columbus,* Presiding

WHAT CAN WE DO ABOUT EDUCATING OUR CHILDREN IN CHARACTER?

L. A. PECHSTEIN

Dean, College of Education, University of Cincinnati

Social environment, not human nature, changes, and the youth of today is by nature not one whit worse nor different than that of a generation or countless centuries ago. Yet youth is in conflict, for which he is not causally responsible. The modern home, it is held, is largely responsible for the conflict of youth. Youth is absorbing the radiating conflict of parents, is being unfavorably impressed by parental inconsistencies, and is suffering because of parental unwillingness or inability to live with the youth in the family. Too often the high-school life of boys and girls is injured by the narrow-minded, sarcastic, and cold teacher, as well as by the tyrannical and untrusting administration sometimes imposed.

The social excesses of adolescence are great, and student groups, with their gregarious minds, have become too strong both for parents and school agents. It is argued that the fault for all this lies mostly with the parents, and that it is only by parental understanding of the problem and a union of parents that the group strength of the adolescents can be properly handled.

A plea is made for parents and teachers to have confidence in youths, to believe in their potentiality for goodness, to give them opportunity to express themselves energetically under wise guidance, and to meet their group strength with a larger and more intelligent union of parents and teachers.

PARENT-TEACHER ASSOCIATIONS: YESTERDAY AND TOMORROW

MRS. C. E. KENDEL

President of Ohio Branch, National Congress of Parents and Teachers, Lakewood

The instinct of self-preservation has been extended by mother love to the care and protection of her young. Modern civilization no longer requires a mother to protect her children by fighting hand-to-hand battles. The instinct is still there, however, and we find that mothers are still working to get something a little better for their children than they have had themselves.

It was this deep desire that urged Mrs. Theodore Birney of Washington, formerly of Georgia, to attend a meeting of kindergarten teachers in New York about 1895. Women had been slowly organizing themselves into groups since the famous Women's Rights Convention in 1848. The National Federation of Women's Clubs followed after many state federations had been formed.

While most of the members of these groups were mothers, the training for parenthood was not the basis of their interest and activities. Mrs. Theodore Birney organized for the first time the parent power of the nation for the welfare of the child in home, school, church, and community.

The parent-teacher association has come to be recognized by educators as the proper agency to interpret the school to the home. Both educators and parents have learned that the other is a human being and that a strong bond of interest, the child, unites them.

The past is a guide to the present. We learn what to avoid and what is still vital to our life today. Demands from a mothers' club could well be questioned by educators, but the findings of a parent-teacher association, where teachers have a voice in the proceedings, will be given serious attention by most school principals and superintendents.

The parent-teacher associations of today show an active interest in community projects, material needs of the school, and the health and welfare of the child. We have no exact record of the extent to which public health education is being furthered by parent-teacher associations, but we know it is great. Many dental clinics and special health clinics have been established by local associations all over the country. This is the third year of the National Health Project, "the summer round-up." We find it carried out to the last detail by hundreds of local groups over the country.

What of the parent-teacher association of tomorrow? Physical health is important as we know, but we must also know the importance of mental health. The significance of the pre-school age in childhood is being noted and stressed more and more by educators and psychologists. Parents are also being told that, as this is a pre-school period not covered by the present school system, it is necessary that they know the right training for this age.

Parents learn much from the study and observation of the child in the home, for even in a family of three to five or more each child is an individual and has more opportunity to express himself as such. Teachers are studying children in a group; determining their reactions to the group and its activities. Both parents and teachers can contribute much to a right understanding of any child and learn much from each other.

In the parent-teacher association of the future, if the sign posts pointing the way mean anything, we shall see parents attending many regular school class sessions in order to learn methods of teaching which can be utilized in the home for the teaching of proper home habits. Classes of mothers and fathers will study the different phases of child life and prospective parents will train themselves for this profession of parenthood. We shall see the home and the school cooperating in all things which will raise the standards of home and community life, in order that the child may enter life unhandicapped. His progress along the thorny path from childhood to adulthood will thus be traveled in wise, understanding companionship.

THE LINCOLN SCHOOL PARENT-TEACHER ASSOCIATION AND ITS WORK

OTIS W. CALDWELL

Lincoln School, Teachers College, Columbia University

The school in which I work is an experimental school. When it was announced, it was said that parents would not trust their children in it. The fact is that any honest experimental school will have an abundance of children, because parents are so interested in education that they would rather trust their children to a school that is trying to improve education than one which is doing nothing about the situation. We know many things tried will not be good, and must be discarded. When one visits an experimental school and finds some things in it unsatisfactory, he should remember that if everything were satisfactory, there probably wouldn't be much experimentation about it. An experimental school must frankly disclaim validity for things that are not valid.

Since such a school must have children of as many types as possible, we announced a program of acceptance of children from all groups of society. Help is given in tuitions for those who cannot pay, and high tuitions are charged for those who can pay. About one-third of the children in the school have their tuition paid in whole or part. An effort is made to keep out children whose native intelligence is too high. The people most concerned about education are the ones who are most intelligent and, biologically, have the children of highest intelligence. The people who are most afraid to trust their children in an experimental school are likely to be those whose children do not rank high in intelligence. The intelligence average in the school is now about 119, as tested by the Binet-Simon-Stanford scale.

Our task with parents is to make them think of their children from a fundamentally psychological point of view. We cannot do this and leave out biology, for, after all, the psychology we need for this purpose is the psychology which has a biological conception of human life.

On the salt-sand coast of southern California, a most interesting thing can be observed, which illustrates my point. If one stands on this coast a little way back from the shore on a hot afternoon a wasp will probably be seen coming from the timbers, flying straight down to the beach. After crawling about a bit she begins to cut a little disc out of the salt-encrusted sand, moistening it and digging at it with her mandibles until it is loosened from the non-salt-encrusted sand below. Then she picks up the disc and flies a little distance. She goes back to the point from which the disc was removed and begins to dig out the softer sand from below. She picks up a little of the sand and flies away with it. This operation is repeated until a den is made four, five, or six inches deep.

Then, without hesitating she flies directly to the point where she placed the salt-encrusted disc lid, picks it up and unerringly flies back to the den, places the disc at the top, and flies away, leaving the den so obscure that it can scarcely be found.

If one waits there for fifteen or twenty minutes, or, perhaps, half an hour, she will be seen to reappear carrying a little worm-like larva of another insect. Before bringing the larva she stings it in a certain nerve-center benumbing, but not killing, it. Dropping the worm beside the den, the wasp goes to the lid, pulls it up, flies a little way to the side, goes back to the den, picks up the worm, stuffs the worm into the den, replaces the lid, and flies away. Soon she comes back with another worm of the same kind, and repeats the process until she has at least five or six larvae in the den, having filled it nearly to the top. Then she lays her own small white egg on top of the last larva, puts the disc back for the last time so far as she is concerned, and flies away never to return. Dr. Vernon Kellogg, who has written the best description of this story, says that as long as one may watch he will never see this mother wasp coming back to look after the welfare of her offspring.

Inside the den the egg hatches. The little worm hatched from the wasp egg eats the larvae, grows until it bursts its coat, devours more worms, grows, and goes through that process until it has devoured all of the worms or has reached its larval "majority." Then it goes into a resting stage, developing about itself a cocoon covering. After having passed through the resting stage, it breaks the coat for the last time. The young wasp crawls to the top of the den, knocks the lid off, or breaks its way out, and appears as a wasp as large as its mother. If it happens to be a female wasp, she will in due time fly down to the coast and repeat the nest-making process of her mother.

How did she learn it? Suppose when she has partly dug the den, you disturb the surface of the sand. Does she come back, pick up the debris, scatter it about, and start again to rebuild the home? She does not. If the process is interfered with at any point, she goes away, and if she builds a nest at all thereafter, she begins again. The wasp can brook no interference with the order of occurrences she has inherited from her parents. She has no power of adjustment.

Let us change the illustration. When a colt is born how much ability has it to accomplish the work of an adult horse? Is the colt possessed of more or less ability than is the wasp at birth? Fifteen minutes after birth a colt can get up and walk, but what a stumbling walk it is—it almost falls down. The colt must have help in locating its first meal but it needs no help thereafter. Inside of a week it knows its friends from its enemies. Within six months a colt learns to race with the others in the pasture. It learns what barbed wire is in one lesson, but it has to have that lesson. There is constant adjustment to changing situations.

Let us turn now to that remarkable individual—the human child. Even when ten months old he isn't of any use around the house. He is in barbed wire all the time, so to speak. People are working with him most of the time, and he is so helpless he would die within a short time if no care was given him. There would not be a child living if they were treated as animals are. Do you understand what this extreme helplessness means? There is an ascending scale from the inheritance of ability to perform specific acts to the ability to learn to perform a wider series of acts under changing environment. The helplessness of the offspring seems to be in inverse proportion to the number of inherited possibilities.

That is what it means to have the problem of education of children in our hands. We have the organism, the only one of its kind in the world so far as we know, whose tremendous helplessness is a direct advertisement of its equally tremendous capacity to adjust to changing situations. Parents should have that point of view about their children; then a new relation will exist between parents and children and teachers. Think of the relationship as represented by a triangle. The parents are one of these angles. There are two lines that connect it with the two other angles. The teachers are one of the base angles of the triangle and the children are the upper angle. A triangle is not complete without all its parts. You cannot study the capacities of children as they develop under changing environment without the three relationships.

Let us see the view of the parent-teacher associations. In 1845, according to the records of the Boston school survey, the teachers did not have much to say about the schools. The school committee had the most to say and it hired the teachers. There was no school superintendent. It took three sessions of the Massachusetts State Legislature before an act was passed allowing Boston to elect a school superintendent. Did parents visit schools before? No. In my boyhood in a rural school in Indiana, when a parent came to school, we knew there was something wrong, for that was the only time they came.

Let me describe now the Parents' Association of the Lincoln School. Ten years ago, when the school opened, we decided we would not have a parent-teacher association. For two years we were without one, but we had parents visiting classes from the first day of school. They were there constantly. They were in the office. They came and went on school field trips with the pupils. There has never been a day in the history of the school, I suppose, when there haven't been some parents in the school.

After two years, a committee of about twenty met to organize. The feeling was, "This is an experimental school.

Let us have no machinery until we find out what machinery we need. Let us start with nothing but a program committee, and anyone, who has suggestions for a program that he would like to have, can consult the program committee." Somebody asked, "Aren't you going to have a constitution?" But why have a constitution until you find out what the living function is? Then make the constitution to suit the function. Thus development was started and I have never seen a group which worked more faithfully or unselfishly. There is now an executive committee composed of ten parents and five teachers. The parents can vote the teachers down but there is no majority that will stand unless its case is right. A school superintendent or anyone else who thinks that by having been elected to a position of authority or by having contributed the largest sum of money to an institution, he thereby procures the privilege of dominating it, is mistaken. The only validity is the validity that rests on your case.

The organization has two types of programs. There are from four to six open meetings each year. These meetings are planned so that fathers as well as mothers will come. At the last meeting we discussed the question, "Who should go to college?" There is nothing new about that question, but the house was filled with keenly interested men and women. In addition to the discussion meetings the children often give programs. The surest way to get a crowd of parents is to use the children for bait.

The mothers organized a morning-study group. They have a lecture on one Tuesday morning in the month, and two weeks later they have their discussion based upon the preceding lecture. The lecturer himself submits a reading list to them with suggestions for topics to discuss. A committee meets after the lecture and formulates problems which are sent out to all members. A fee sufficient to carry the expenses of a program is assessed. The groups are small, but intimate, honest, and frank in their discussions of the capacities of children and what to do about their education.

Another function of our parents' association is to report to the office anything wrong about the school. We have tried to cooperate with the parents by hearing each case and to operate an experimental school on the assumption that nothing is finally settled if there is sufficient reason for a change. If the parents study the situation thoroughly, what they want the school to do will be right. They are governed by the same rules as the children and the teachers.

There is one other thing that this parents' association has just done, a thing in which I take great pride. Our building and property were given to us by one of the foundations interested in experimental education. We could not get money for experimental education in any other way. After ten years in the development of this experimental school, we needed a new research building and a swimming pool, so the parents took up the problem of raising the necessary $400,000. There are not many wealthy families in the school, but it was agreed that they would not be asked to give, because they had helped to establish the fund which had given us our start. The school has but 480 pupils in it, and has graduated only six classes from its high school, so there is no large group of alumni. There are 367 different subscriptions to that building fund, including two $1 subscriptions and one $2 subscription, which is as much as those people should have subscribed. About 300 of the 367 are of $100 or less and only ten were for $10,000 or more. However, the parents did raise the $400,000.

When the school was established, some critics said "Don't send your children to an experimental school. They treat them like guinea pigs." Now, these people who sent their children to an experimental school have a building in which research work may be done for the sake of improving public education. That is the best achievement and the most unselfish thing I ever knew a parents' association to do.

Cities all over the country are organizing for adult education. We are developing a nursery school for little children. One of the members of my staff has two children, one a year old and one three years old, both of whom are in nursery schools. As one of the three directors of a nursery school I am greatly interested in the subject, but I am afraid we are missing something. There is no greater problem for adult education to face than the proper education of children. You say that is the school teacher's business. No, it is everybody's business.

We have changed our conception of adult education. There isn't a member of the staff of the department of education here who doesn't feel that he is just getting started on the things he ought to do. That is the idea everyone has to have if the right thing is to be done by children and if those children are to develop ability to adjust themselves to changing conditions in order that a fuller and better human life may be lived.

PHYSICAL EDUCATION

MEN AND WOMEN

LYDIA CLARK, *Ohio State University,* Presiding

PHYSICAL EDUCATION AND GENERAL EDUCATION

B. H. BODE
Ohio State University

Physical education for a long time has had no significant place in the program of general education. At the present time, however, there is a widespread disposition to emphasize its importance. This disposition is justified because physical education can do much for the cultivation of the play spirit, confidence toward life in general, and intellectual interests.

It is becoming increasingly recognized that all significant education involves the element of play. A student who goes beyond what is "good enough" in order to secure perfection in an essay or an argument or a physical experiment exhibits a spirit akin to both art and play. Physical education has a special responsibility for the cultivation of the play spirit, just as the teaching of literature has a special responsibility for the cultivation of the technique involved in securing and heightening appreciation. The play spirit is of great importance. Persons who do not have it, as, for example, the Puritans of old, are morally defective. They do not have a ready sympathy and an active imagination in dealing with others. The besetting danger of physical education is the tendency to neglect the importance of the play element and to convert physical exercise into a routine of chores.

Modern man is making rapid progress in the art of controlling his physical and social environment. As a consequence he is developing a change in attitude. The sentiment "I'm but a stranger here, heaven's my home," is inaccurate as an expression of the modern outlook. The present tendency is toward a greater interest in the solution of physical and social problems and a greater confidence in man's ability to achieve his heart's desire. Nevertheless, a great deal of modern education is still of a bookish character. There is need of physical education, since the ability to use one's hands and feet has an important bearing on a person's disposition to feel at home in the world.

Physical education can tie up intimately with intellectual education. We are leaving behind the notion that body and mind are opposed and that the training of one is wholly different from that of the other. We are beginning to realize more fully that the training of the mind involves training of the body and vice versa. Physical education is still confronted with serious problems which must be solved progressively if it is to make a proper contribution towards keeping men and women physically and mentally youthful, with spontaneous and general sympathies and creative imaginations which spring from the spirit of play.

MEN

H. R. Townsend, *Commissioner of the Ohio High School Athletic Association,* Presiding

INTRAMURAL ATHLETICS IN THE HIGH SCHOOL

W. J. Springer
Coach, Salem

All normal boys and girls have the desire to play. It is part of their growth and development from early childhood. As they grow older changes take place in the form and degree of this recreation. At adolescence many are too self-conscious and timid to take part in varsity competition; yet they may harbor the desire for playing these same games under satisfactory conditions.

Intramural athletics were found to contain the same spirit of competition which has caused the marked and rapid growth of interscholastic athletics during the past few generations. Although the ability is usually of an inferior nature, the satisfaction derived from physical contact and quick thinking is just as keenly felt by the beginner as by the veteran athlete. Intramurals are likewise more free from nervous and emotional strains that characterize the varsity team which represents the school in a particular sport.

With the advent of the increasing popularity in athletics, criticism was made that the advantages were for the comparative few who were fortunate enough to become members of the team. The creation of a need for more general participation of students resulted in the gradual growth of intramurals. Our great American colleges took the first rapid strides in this direction. In a short time the high schools applied this means of enlarging their athletic program. This great movement in physical education is merely in its infancy.

As the situations in two school systems are never exactly the same, it is necessary for each physical director to work out his particular solution. However, many ideals are applicable to all of our needs. It is with this purpose in mind that the details used in the program for Salem High School are presented. In this school system there are approximately 475 pupils in the two junior high-school grades and 580 pupils in the four senior high-school grades. The physical education staff is composed of two men and one woman. One man acts as the supervisor in the lower grades, teaches manual training, and has charge of the intramurals in the junior high school. He also serves as assistant coach to the senior high school. The athletic director acts as the boys' physical training instructor for both junior and senior high schools, coaches the boys' varsity teams, teaches two academic classes daily, and is associated with the physical director of the girls in arranging a program of intramurals for both boys and girls. The physical-training instructor for the girls also teaches two academic subjects and coaches the girls' basket-ball team. This plan has worked satisfactorily in a school system of this size.

At the beginning of school in the fall, a call is given for girls' interclass field hockey. The athletic field nearby is the scene of many interesting hockey games during ideal fall weather. At the close of the regular series, two all-star teams are chosen for the title game and members of both teams are awarded numerals. The boys are not neglected, for an interclass football series, in which each team plays six games, is conducted. In these contests varsity equipment is loaned the class teams, and the games are played on Fridays after school previous to a light practice of the varsity.

When the weather becomes cool, volley ball holds the center of interest among the sixteen home rooms, each of which is represented by a girls' and boys' team. This number offers an ideal situation for an elimination series to decide the inter-room championship. Before the tournament is conducted, each team is given several practice games which permit the inferior teams to become better organized. Schedules with directions are posted on the bulletin boards in the locker rooms and hall; announcements regarding rules and other details are frequently made in the school assembly. Competent referees and judges are carefully chosen from the students by the physical directors. These pupils are not permitted to officiate at games in which their home rooms are represented so that they be wholly neutral. Boys and girls alternate in their play, there being two games each day at noon and immediately following school in the afternoon.

After determining the inter-room champions, an interclass series provides a more spirited competition. Captains are elected by the candidates for each class team. Two complete rounds occupy the attention of the schools for five weeks, the winner being determined on a percentage basis. Approximately 350 boys and girls take part in the entire volley-ball series.

Intramural basket ball is regulated much in the same manner as volley ball. Both games are played in the well-equipped gymnasium. An iron railing around an elevated cork running track encircles the basket-ball floor from which the pupils witness the games. So great is the interest that pupils return early from lunch for the noon games, and many stay for the afternoon games.

A census taken during the past winter revealed that 375 boys and girls were regularly active in the basket-ball series. This represented 65 percent of the enrollment of the senior high school. A similar ratio would be found to exist in the junior high school. The high-school gymnasium is a mecca of enthusiasm each Friday afternoon and Saturday morning of the winter season during which time more than ninety junior high-school games are played. Members of both high-school varsity teams act as unprejudiced officials. Even those who are not active in the intramurals have an opportunity to play in short basket-ball games once each week in the physical education classes, in addition to discussing rules and methods of the game.

In the spring of the year our attention is directed to volley ball, indoor baseball, track and field, and tennis. An interclass series of volley ball provides a good-natured rivalry twice daily while several hundred student spectators gather about the iron railing cheering their favorites.

Indoor baseball has been thus far confined to classes where it has been accepted with marked approval by the pupils. The boys' program is alternated with the giving of an Efficiency Test, which includes the 75-yard dash, 100-yard dash, shot-put, chinning the bar, running high jump, running broad jump, and 80-yard low hurdles. The last two events are given during May on the athletic field when the weather is favorable. At first the hurdles were attempted on indoor cork track, but since falls were not uncommon the outdoor method proved more satisfactory. By counting ten points as the maximum, and one point as a minimum score in each event, the individual's total is computed. A perfect score would be 70, but that would necessarily establish a record in each event. As a recognition for achievement, the names of the first ten boys are listed on the bulletin board and are published in the school paper.

Preceding the first track and field meet of the varsity schedule, an interclass meet is held at the athletic field. Ribbons are presented the winners of the first four places in each event. Letter men from the previous year are barred in this competition as it was found that many more boys of little experience would compete if they were assured that it was purely for them.

The junior high-school track meet has become an annual affair which is held late in May. Attractive championship banners are presented the winning room in both boys' and girls' divisions.

We held an elimination tennis tournament which proved quite successful. In the doubles the boys were permitted to choose their own partners since this was not an interclass competition. A tennis manager was appointed to take charge of the elimination which was played on several local private courts.

The high schools of Cincinnati have substituted an active and enlarged program of intramural basket ball for interscholastics. No doubt this new program was put into practice as a result of the common criticism that interscholastic athletics holds benefits for the comparative few. It is interesting to notice the reactions. A recent newspaper article from Cincinnati explained that although there were many more participants involved, enthusiasm and school loyalty were lacking. They are considering reinstating interscholastics in the future. It seems that both systems must be used if we hope to have a well-rounded program of physical education.

In the average school system where the athletic director is also the intramural director, advantages of one harmonize with the other. A well-organized intramural schedule produces prospective talent for interscholastic competition. A good enthusiastic situation in the latter arouses interest in the underclassmen who find means of expression in the intramurals.

A boy or girl who desires to compete in a smooth-running intramural program must meet the same eligibility requirements as the varsity teams which provide an incentive for further study on the part of the individual. Without this restriction the very purpose of a complete system will have been lost.

Although formal gymnastics have physical and disciplinary advantages, the freedom of play offered in this new form of athletics is most beneficial. It gives to the individual moral and social advantages which the former do not include. The successful participant learns to control his temper, to congratulate his conqueror, and to maintain a loyalty to his team mates; all of which is evidence of character building. A feeling of confidence is experienced by the adolescent youth with an athletic achievement which kindles a desire for further improvement. This provides a great amount of stability at the critical period in the lives of all American youths. We should certainly include as one of our aims in physical education a one-hundred-percent participation in intramurals.

THE HIGH-SCHOOL COACH AS HE IS

J. E. Bohn
Principal, Kenton High School

Five hundred and thirteen coaches of athletics in Ohio were classified into four groups: I, city coaches; II, exempted-village coaches; III, coaches of county high schools of more than one hundred pupil enrollment; and IV, coaches of county high schools of less than one hundred pupil enrollment. Statistics were compiled from answers to a questionnaire concerning the status of the coach in regard to salary, tenure, age, teaching load, coaching load, certification, summer work, selection, professional preparation, and special preparation. The following facts were found for the school year of 1925-26.

Median salaries of coaching groups were as follows: I, $2,180; II, $1,750; III, $1,587; IV, $1,390. These medians were higher than the medians of the average salaries of the teachers in corresponding groups. High-school principals received much higher median salaries in each group. The principal who coached was not paid more than the principal who did not coach.

The average number of years the coach had been in his present position for each group was: I, 2.81; II, 2.17; III, 1.82; IV, 1.47. For all coaches the average was 2.08 years. The median of the total years of experience for each group was: I, 4.6; II, 3.4; III, 2.55; IV, 2.18. For all coaches the median was 3.19 years.

Of the coaches who reported, 26.8 percent had no college degrees. Three-fourths of these were found in county high schools of Groups III and IV. However, 92.8 percent of the principal-coaches had degrees. The median number of semester hours of professional training of all coaches was 30.1 hours. Many coaches were lacking in special training, particularly in group games, play and playground work, and first aid. During the years 1920 to 1926, summer school was attended for one or more years by 64.5 percent of the coaches.

Certificates were named by 87.5 percent of the coaches. Life certificates were held by 16.6 percent, and four-year provisional certificates by 35.9 percent. This indicates a permanent interest in education on the part of 52 percent of the coaches. In 88 percent of the cases reported, the coach is selected by the board of education, or the board and the superintendent, or the superintendent. The principal had a part in the selection in only 12 percent of the cases reported.

The six best bases on which school administrators would select a coach were rated as follows: character, personality, good habits, concept of athletics, sportsmanship, and intellectual ability. The oldest coach reported was forty-nine years old. Only 11.4 percent of the coaches were more than thirty years old while 40.3 percent were less than twenty-five years old. Coaching is a young man's game.

Coaches spent enough time after school hours coaching football to equal 31 school days of seven forty-five-minute periods each. Too many coaches are burdened with girls' sports which should be directed by women coaches. School administrators should select the coach with care and then give him full sway of his powers in the handling of boys.

CONDITIONS ENTERING INTO THE SELECTION OF A HIGH-SCHOOL COACH

Floyd A. Rowe

Director of Physical Welfare, Cleveland Board of Education

Without question, the first consideration in selecting a high-school athletic coach should be: Is he morally responsible? By morals is meant the entire philosophy of conduct of the individual. Personality, although intangible and often overworked, is important and must be considered along with education, experience, and possibly last, motives or mental attitudes. Education is a topic which cannot be dismissed in a sentence. Its implications are legion.

Another important factor which of necessity must be considered when considering education is the personnel of the faculty of the college attended. Not only does one want to know about the faculty, including the coaches, but also about the success of the teams, and why and how they became successful or unsuccessful. Success attained in some ways is a splendid thing, and of exceeding value, but gained in other ways it is to be shunned.

It is essential to know who the teachers are, and how and what they teach. This is quite as important a factor in the selection of a coach as any other single thing.

There are points about the education of the individual that are of interest, such as: What subjects were the individual's major and minor? This often tells a story to the trained personnel investigator. In other words, was the individual an athlete first and a student second, or a student first and an athlete second? Trusting then that you agree in the three mentioned characteristics necessary among the qualifications of the desirable coach, namely, moral responsibility, personality—at least not negative—and education, let us pass on to the next thing.

Has the applicant had experience? If so, what has it been? Why is he desirous of leaving his present place of employment? Since nothing succeeds like success we are interested in a successful applicant but success is such a relative quantity that it needs to be analyzed rather carefully. For example, an Ohio State victory over Illinois by ever so small a margin is success. An Ohio State victory over Wesleyan by the same margin is success for Wesleyan. Therefore, true or real success can only be measured or estimated when all the facts entering into it are known. So we see that more must be known about any situation than can be told by a simple statement of contests won and lost. Has the applicant been successful because of natural ability and leadership or have there been other factors?

The motives or mental attitude of the individual must finally be considered. What are the intentions of the individual? What prompts the individual to take up this line of endeavor? Probably the first question to ask is: How long do you expect to continue in this work? The motives of the applicant can be judged as a rule from his answer. Competitive athletics can be made to teach honesty, fair play or sportsmanship, self-control or self-discipline, team play or cooperation, and morale or school spirit when properly taught. All of the terms used—honesty, sportsmanship, self-control, cooperation, and morale—are relative terms. However, no one of you can successfully defend anything but the teaching of absolute honesty. The ideals of clean sportsmanship can only be taught by the person who has come through the tests in a manner to satisfy all of the foregoing practical requirements.

THE COACH AS CITY RECREATIONAL DIRECTOR

Dana M. King

Coach, Hamilton

On June 3, 1917, the City Council of Hamilton voted to submit to the people a one-half mill tax levy for the purpose of purchasing and beautifying land for parks and playgrounds and for conducting a recreational system. This levy was passed by the people and the council then prepared legislation for proper handling of this fund.

They established a Park Board, composed of three members, appointed by the mayor, who were to have entire control of this fund. After several plots of land had been purchased, and some converted into beautiful parks, the question of playgrounds and a recreational system was considered.

The greater part of this fund having already been used for the purchasing of land, they felt an extensive recreational program could not be carried out. It would likely consist of conducting playgrounds during the summer vacation for school children. A joint meeting of the Park Board and Board of Education was held. They decided that a more desirable position could be established if the duties of coach and recreational director could be combined.

As the recreational director was to conduct playgrounds during vacation, no conflict in work was seen. The Park Board agreed to continue the salary of the coach throughout the vacation months, and to pay him on the same basis for any work which might be necessary at other than vacation months.

During the first year the work consisted of routine playground work, the organization of a junior and senior boys' baseball league. At the close of the season a playground pageant was given in a large woods which had just been acquired for playground purposes. This pageant served to bring the playground work before the people and to secure their support. No attempt was made at adult recreation this first year.

Since the first year of the coach-recreational director plan, an increase in the duties has presented new problems. The coach has been made head of the Department of Physical Education. The local Lions' Club raised $20,000 for a municipal pool. To this the Park Board added $15,000 and constructed a modern pool 150 feet long and 70 feet wide. This pool was run by the park superintendent with recreation under the recreational director. Inter-playground competition is used in the pool. This is divided into three groups, senior, junior, and midgets. Contests are conducted about twice a month with points for the winning playground in each event. On holidays, special contests are held and outstanding swimmers are brought in for exhibitions.

Many tennis courts have been added. Each playground has one or two for children of school age. At the high-school athletic field, special courts have been constructed for adults and tournaments. During August, tournaments are held for women, men, senior and junior boys, and midgets.

One hundred acres have been donated to the city for a golf course. This has been constructed by the Park Board. The recreational director has charge of all recreation and tournaments on the course.

All baseball fields are under control of the Park Board or the School Board. This makes it possible to control all leagues. Regulation baseball and kitten ball have proved very popular.

We have attempted to get as many different men and boys playing in our leagues as possible. In order to further this plan we permit a player to be a member of one team only. A total of forty-two teams of men and boys were playing the regulation ball and seventy-two teams played kitten ball in leagues. This makes a total of 114 teams. Each team having eighteen men under contract, gives a total of 2,052 different men and boys, or 5 percent of the entire population of Hamilton, on some baseball team.

We have received inquiries at different times as to whether there was not a tendency for the recreational work to interfere with the coaching. We might say in answer to this that all activities except the leagues are conducted during vacation; our different leagues are organized during the months of March and April at meetings conducted in the evening. After the organization, an assistant takes care of details of leagues, such as filing release cards and contracts, securing officials and supervising the office. If the assistant is efficient and familiar with his work, little remains to be done by the coach other than can be done during evenings. The same plan is followed in September when leagues are closing and city championships series are being played. Again others have said, "How about winter recreation?" A coach certainly has not time to do any recreational work in the winter.

In cities of eighty thousand and more it probably is necessary to have a full-time recreational director. If a municipality does not have control of several gymnasiums, it is doubtful whether a strong recreational program can be put on. Our work is taken up in the fall by the Y. M. C. A., the Y. W. C. A., a colored community center, and the K. of C. These organizations conduct leagues and extensive winter programs and leave little to be desired by the public.

In the schools, under the supervision of the coach, leagues are conducted for different grade schools. In high school, volley ball, indoor baseball, and basket-ball leagues are conducted. With each organization, cooperating and running along the plan of summer organization, a satisfactory program has been developed.

There seems to be many advantages in the coach-recreational director combination. When two thousand men and boys are members of our league teams, just that many are taking an interest in their own physical welfare, just that many feel the benefits of exercise in the sunshine and fresh air. They are now enthusiastic supporters of athletics. They are now faithful readers of the sports page of the daily papers. They are becoming real fans, and in as much as the high-school coach is their recreational director, they will certainly be somewhat interested in high-school athletics, and we believe the majority will become enthusiastic loyal supporters of the coach's teams.

Of these two thousand the coach has an opportunity to come in close contact with the one hundred managers through organization meetings, general meetings, and arbitration meetings. These are excellent opportunities for the coach to show that his ideals are above just winning of games—that he stands for character-building, first, last, and always. These ideals will be carried by the managers among your fans and the down-town coaches association, and should aid in keeping the crowds' attitude toward the visiting players and officials more wholesome.

To our way of thinking there is one individual in a city who should have charge of the boys' early athletic training, and he is the coach. The coach as recreational director has his playground leagues with each team under direct control of a playground director. The directors are responsible to the recreational director only, and will insist that his ideals be carried out. The boys will be taught the conduct, sportsmanship, training rules, and fundamentals necessary for high-school athletes.

SHOULD HIGH-SCHOOL WRESTLING BE ENCOURAGED?

B. E. Wiggins
Director of Physical Education, Columbus

Wrestling is one of the oldest forms of exercise and competition, dating from the very beginning of the race. It is natural for every normal boy to scuffle or grapple with his fellows, which becomes what we term wrestling as greater skill is acquired. If it is reasonable to assume that the educational value of various forms of physical education is attained through the development of motor skills, self-control, muscular and organic health and strength, and the quickening of a high sense of fair-play, then high-school wrestling, under careful and intelligent supervision of school authorities, should be accorded a place on the calendar of sports.

While wrestling is practiced by almost every tribe and nation, there are some distinctive types which have been developed from the earliest times until the present day. The Greeks from early Olympic times and on through the Periclean Age and later, probably developed wrestling to a greater degree than any nation of antiquity. These wonderful exponents of physical, moral, mental, and aesthetic development surely believed in virility and grace of body. Other distinctive styles of wrestling may be summarized as the Greco-Roman, Jujutsu, Cornish, Lancashire, Cumberland, American Indian, and the modern style known as catch-as-catch-can, which originated in this country. All of these various styles or types are intended to develop skill, stamina, self-mastery, good sportsmanship, alertness, and strength.

Active opponents, and also many who may be said to be neutral in the matter, too frequently condemn this sport because of newspaper accounts of professional wrestling. It is a well-known fact that there are many questionable practices among professional wrestlers and promoters today, just as there have been in other ages and other countries. But to assert that such practices nullify the benefits to be derived from wrestling as an amateur sport under proper auspices, is illogical. The argument that the influence of professionals is condemnatory can be applied to practically every known sport. One might just as fitly stigmatize tennis, football, and baseball as being tainted because the root of all evil sometimes grows to giant size and casts its shadow over almost every human activity. Loose and unintelligent supervision of any form of physical competition, and particularly that of a personal-contact nature, will result in undesirable after-effects in the educational field and elsewhere.

As a participant, coach, and close observer over a period of three decades, the writer is convinced that minor and major physical injuries, such as breaks, strains, abrasions, and dislocations, are far less common in amateur wrestling groups than, for instance, groups of corresponding size and age in football; that emotional stress and reactions therefrom have been appreciatively less in the former group; that mental and physical tension preceding competition in both single matches and tournaments is, as a rule, noticeably lower than is observable in football, some track events, and boxing; and, that the State High-School Wrestling Championship Meet held at Ohio Wesleyan University last year resulted in no censorable after-effects.

State or sectional high-school wrestling meets are sanctioned in Iowa, Indiana, Michigan, Minnesota, New Jersey, California, Ohio, and Massachusetts. Well-organized boys' clubs throughout the country, such as Hull House in Chicago, and St. Thomas' in New York, encourage and promote wrestling for boys. Y. M. C. A. organizations throughout the country give wrestling instruction and promote the sport. Last year the first state meet was held under the auspices of Ohio Wesleyan University at Delaware, and it proved a successful affair. Columbus has conducted city championships in wrestling during the past four years and there have been no harmful results. The rules and regulations in Columbus may be briefly outlined as follows:

1. Time limit of bout eight minutes
2. Holds barred—strangle, full-nelson, hammer-lock, head-scissors, all toe holds, all wrist locks
3. The referee has full power to disqualify for all holds applied for punishment only, and also for deliberate "stalling" to avoid a fall by leaving the mat

To summarize, it is my belief that high-school wrestling is a wholesome and generally beneficial form of exercise when coached and properly supervised by some member of the school faculty and the necessary limitations placed upon the time of bouts and holds. On the other hand, if professional wrestlers—not members of the faculty—or influences are sanctioned, and practically no limitations are placed upon physical fitness, duration of effort, and holds barred, this sport should not be permitted in our high schools.

THE FOOTBALL CODE AND THE OFFICIAL

F. A. Lambert
President, The Ohio Association of Football Officials, Columbus

The football official has a definite relationship to the game itself and is an important factor in the sportsmanship of each contest. Doctor J. F. Williams of Teachers College recently said, "All of the best values that college and high-school coaches have sought for their teams frequently have been lost by incompetent officials." Sportsmanship is, in the final analysis, a state of mind.

There is an increasing tendency each season for both players and coaches to measure up to the ideals of this code. The conduct, execution, and personalities of the football official, or coach, are factors in the ultimate realization of the code. The enforcement of fair play is his principal function. Through his personality and understanding of young men he also can assist materially in the creation of an atmosphere and attitude of genuine sportsmanship. To create this value in the game, he must be proficient and accurate in the discharge of his commonly accepted duties and also be heartily in accord with the code.

Among the best values of football is the development of a spirit of fair play and self-control in the young men participating. Is it not easier to give the young man this vision of fair play and self-control in the game which is well and fairly officiated? When the official plays this important role in the realization of the greatest intrinsic values of the game, why have we given so little consideration to the matter of developing football officials?

Interscholastic football is a considerable part of our work and the boy participants are of an even more impressionable age than the college players. To receive the maximum benefit of participation for these boys, the contests must be properly officiated and orderly directed. Unfortunately, this ideal situation does not exist generally. One of the most difficult problems confronting state high-school athletic commissioners is the supply and selection of desirable officials. Too many games are improperly officiated and later protested.

Another of the important problems in interscholastic football has been to bring the boys within the influence and regulation of the school itself in the matter of organized sports rather than to have them dominated or influenced by the "town gang." We have observed that there can exist no town gang and no disturbing element following a game which has been officiated properly by men of judgment and diplomacy. Officiating is, generally speaking, a side-line. Officials are for the most part unorganized, except in certain localities; this fact is most regrettable. An insufficient competition exists in the officiating.

Educational institutions have developed football and should control it. Interscholastic football bears such a direct and dependent relationship to the intercollegiate that we cannot wisely close our eyes to its needs. Would it not be advantageous to take some definite and constructive action to develop officials and teach the rules of the game? Some suggestions by which we believe the weaknesses of football can be strengthened are given:

1. Under the auspices of the state university or a conference of colleges, together with the state high-school athletic association and the state football officials association, an annual meeting should be held prior to the opening of the football season for the study of rules and officiating procedure.

2. Complete, detailed, and comprehensive courses of instruction in officiating and study of rules should be given in the universities and colleges now offering regular and summer courses in football.

3. The rules committee should endeavor to have the football rules distributed on or about July 1 of each year. This would make possible a detailed study of them in the latter half of the summer schools and allow a longer period for officials to study and assist each other.

4. Officials and coaches should avail themselves of opportunities to explain the rules to high-school football squads at luncheon clubs and in various gatherings of boys and men interested in the game. They should also cooperate in the writing of articles for the press which accurately set forth the alterations in the rules and show how these affect the play.

5. It would be advantageous and in the best interests of sportsmanship to have a joint committee of coaches and officials formulate a code setting forth what should constitute proper conduct and relationship for both the coach and the official before, during, and immediately following a contest.

WOMEN

LYDIA CLARK, *Ohio State University*, Presiding

HEALTH VALUES IN PHYSICAL EDUCATION

SHIRLEY ARMSTRONG
Ohio State University

Physical education, as education through motor activities, covers a broad place in general education. The objectives of education as a whole are also the objectives of physical education and to these are added certain specific aims. The educational, social, corrective, recreational, and the hygienic values are all considered as objectives of physical education. No aim, at present, is more emphasized than that which has to do with the science of health. The value of physical education to health is largely based upon an increase in the vital functions of the body, which aid in more efficient living and add a keener enjoyment to life itself.

Independent motion is a characteristic of all animal life. In earlier stages of development the existence of the individual depended largely upon the development of the muscular system and the nervous control of that system. During the years of evolution muscular exercise in labor, in war, and the chase was a major element in human experience and on this depended the survival of the individual. Now, less and less muscular activity is demanded because of the changes which have come about in environment. For this reason, less exercise is taken and there is a consequent weakening of the muscular tissue so that if the individual does exercise fatigue quickly results. To an individual accustomed to exercise the immediate effects of the lack of exercise are apparent if he goes even a few days without it, but to an individual who is not accustomed to exercise these immediate effects are not noticed. However, most individuals are aware of the more remote effects. The degenerative diseases of middle life, which are largely due to defective circulation and improper elimination, occur more frequently in individuals who have become inactive.

The benefits of exercise come primarily from the muscular system. It is a proposition capable of scientific proof that muscular exercise raises the vital processes of life to a higher level and a greater degree of intensity of reaction. In itself the muscular system is of value in that it maintains the proper alignment of the skeleton and aids in keeping the abdominal organs in proper position and helps in maintaining a normal circulation to the tissues by the pressure which is exerted on the veins and lymphatics in contraction.

The impetus to contraction arises in the motor center of the central nervous system and is carried by a motor nerve to the muscle. As the muscle cells contract they scatter some of their contents into the lymph spaces encircling them and absorb new nourishment from the surrounding plasma. Repeated contractions result in increased bulk, strength, and elasticity of muscle tissue. This effect on the muscle itself is perhaps not so important as the influences that the process of contraction exerts indirectly on other processes of the body.

During exercise the rate of circulation is increased in order to supply tissues with larger amounts of oxygen and to remove carbon dioxide. The activity of muscles produces an increase in the venous return to the heart by mechanically squeezing out the venous blood and lymph from the tissues. In order to take care of this the heart may increase its output per beat or the rate of beat, for in either case the output per minute would be increased. The initial acceleration of the heart is due to stimulation through the nervous system which is connected with the nervous stimulation of the muscles. The increase in arterial tension increases the circulation to coronary vessels of the heart and improves the tone of the heart muscles and the contractive force of the heart. A heart trained by exercise is larger and is capable of doing more work with less effort than an ordinary heart.

There is an increase in respiration which corresponds closely to the speeding up of the circulation. As a result of exercise there is also an increase in eliminations through lungs, skin, and kidney. The function of digestion may be improved by effects of exercise.

By this brief explanation of changes which take place during muscular exercise it has been shown that there is an increase in vital functions of respiration, circulation, nutrition, and excretion. The question may now be asked, "Of what value is this speeding up of the vital functions? Are there not many individuals who get along very well with all vital organs functioning at rate set by sedentary life?" The answer is—These individuals are living on a lower plane of efficiency. They are living uneconomically without proper insurance for future health, far below the level of their motor capacities, and without that keenness and sense of well-being that a greater intensity of reaction brings.

DEVELOPMENTAL AND CORRECTIVE EXERCISES

Esther Gilman
Ohio State University

Corrective or special gymnastics deals with the student who has some sort of maladjustment to correct. Usually it is a definite functional or organic disability or deformity and the problem is to arrest, improve, or overcome the handicap in so far as exercise and instilling correct health habits and practices of good body mechanics will help the individual to do it. We must also help the student to understand her particular problem as well as the ways and means of overcoming it. It may be only a mild injury or strain; fatigue or weakness following a severe illness or overwork, but a definite problem which, if not taken care of, may mean a serious handicap for life.

Since the majority of these students have faulty body mechanics and poor muscular coordinations their first exercise deals with the analysis of correct standing posture, their individual faults and how to correct them. After this comes the correct use of the body in various exercises that the maximum benefit may be gained, for exercises must be done correctly to be of value and prevent harm. Then too, the student must know and practice good body mechanics to get maximum strength, coordination, poise, and efficiency with minimum amount of effort, energy, or tension.

Exercise is more beneficial in the horizontal position. This is because mat exercises are taken with minimum amount of weight bearing. Downward sag of organs is relieved and with practically no muscular effort the different parts of the body are held in relatively normal position.

Then, too, relieved of the effect of gravity, the heart works more easily. "Joints are moved by muscles and upon integrity and proper tone of muscles depends the proper function and resistance of joints."

We have learned from Dr. Armstrong the effect of exercise on the circulatory and respiratory systems of the body. Increased respiration that comes as a result of activity is much more beneficial than breathing given as an exercise. Flexions illustrate all the above mentioned effects, as they increase circulation and respiration, give chest flexibility, and massage and stimulate abdominal organs. It is classed as a general exercise.

The knee-chest exercise is good to overcome and help correct the ill effects of the upright position due to the constant downward pull of gravity and sedentary occupations, both of which tend to relax abdominal muscles causing organs to sag out of place with resulting poor abdominal and pelvic circulation and faulty functioning of the organs. This position allows the organs to fall back into normal position, relieves strain and improves abdominal circulation. It also relieves the pressure of abdominal organs on the pelvic organs and thus relieves congestion in pelvis and improves the pelvic circulation.

Professor Cannon of Harvard says that moderate exercise helps digestion; that very vigorous exercise, causing contraction of the splanchnic area or when associated with excitement as in competitive sports, interferes with the digestive processes. This fact, it seems to me, should be kept in mind and students who are very much underweight or who lose weight to any degree should be allowed to take only moderately vigorous activities.

Pumping strengthens and massages abdominal muscles, especially around the stomach, and increases circulation of stomach thereby stimulating digestion. Knee circling, following pumping, further stimulates peristaltic action and stimulates excretion and is therefore especially good in cases of sluggish elimination, because it increases circulation, massages, stimulates, and strengthens the walls of the organs of digestion and elimination, and strengthens the abdominal wall.

Since fatigued muscles never gain strength, a short period of rest is sometimes more beneficial than more exercise. Dr. Goldthwait has called rest "Natural Therapeutics." When resting the individual should be taught the art of complete relaxation. The whole body should be considered when giving exercises, also to give the muscles of the trunk a rest it is wise to include foot exercises. Foot circling increases flexibility and strength of foot and ankle.

I have found from my experience that it is better to gain flexibility only as strength is improved. This helps the individual to keep better posture and prevents slumping into worse positions than originally as would be the case if flexibility were increased faster than strength. The shoulder-girdle exercise stretches the pectoral muscles of chest and at the same time strengthens the adductors of shoulder, girdle, and upperback and neck muscles. Trunk muscles, especially abdominal, lateral trunk, and lower back are the keynote to good posture. The scissors exercise involves and strengthens all of these muscles beside teaching relaxation and stimulating general circulation.

In conclusion, the benefits from these exercises are: increased blood and lymph supply; increased heart rate; redistribution of blood-relieving congestion and stagnation; increase in size, strength, and endurance of muscles; increase in chemical changes of metabolism and promotion of normal appetite and digestion; relief and counteraction against upright position and sedentary occupations; growth of active parts through anabolism; promotion of normal rest, sleep, and relaxation.

DEVELOPMENTAL SWIMMING EXERCISES

LEONORE ALWAY
Ohio State University

As physical educators we are all endeavoring to accomplish a few very definite results. We are gradually breaking down the belief that our sole purpose is body development and are establishing ourselves as those interested in the threefold development of body, mind, and spirit that makes a harmonious life possible. These three phases represent social, educational, and bodily development—no one comes from any one form of activity. In discussing the developmental qualities of an activity or an experience, these three values should be stressed, but as the recreational and educational values of swimming are far more assertive than the bodily development, I am going directly to the last. Assuming that we have a general need for exercise, we are correct in believing that swimming answers this need if it supplies the need in an adequate and interesting manner.

In order to be adequate, we expect our activity to increase the functional activity of the vital organs and to stimulate and allow for equalized growth and development of the body structure and musculature. By this equalized growth and development of the body the correct anatomical relationship between bodily structure and organs and the development of muscular coordination of the most efficient type is assured.

In discussing these values, I refer to swimming as an active process—not mere bathing and floating—covering a period of several minutes' active work—the results to be in proportion to energy expended without actual fatigue setting in.

Increased organic activity may be said to start with increased respiration. In swimming, quicker and fuller respiration is brought about in two different ways. First, as in no other activity, the swimmer sets up a conscious, controlled, rhythmical inhalation and exhalation at a rate just double that of ordinary respiration but equally full.

Second, the exercise of continual arm and leg motion causes increased respiratory activity. This increased respiration increases lung capacity and heart control in addition to the cycle of organic stimulation it starts.

An increased supply of oxygen to the heart quickens the circulation of the blood, carrying more oxygen to the glands and tissues and improving the digestive and eliminative process. Circulation receives an added stimulation from the effect of the water in contact with the skin.

Due to the position necessary for body balance in the water, a good starting position is assured. In a float or push-off the body is supported in an extended but relaxed position. The start and finish of the crawl, breast, side—in fact all of our strokes—are in reality tiptoe positions. There is possibly a slight hyperextension in all but the relaxed, supported position of the body and the activity of the abdominal muscles in all strokes makes this negligible. In this position we have the internal organs under no strain and in their correct anatomical relation whether on back, face, or side.

Comparatively speaking, swimming is like dancing in that the movements are continuous and rhythmical. For each period of active contraction of a muscle or group of muscles there is an equal period of relaxation. These two periods are commonly spoken of as "work" and "recovering" periods. Regardless of increasing speed these two periods remain equal. When asked to try speed the inexperienced swimmer omits the relaxation period, lessens general endurance, and introduces the localized, sharply defined movement detrimental to good swimming.

Swimming instructors and performers believe that swimming is unexcelled as exercise for the symmetrical development of the body producing supple muscles rather than the hard, bulgy ones of the acrobat or the overdevelopment of one group at the expense of the others. Experienced teachers believe that swimming has great value in the treatment not only of nervous disorders but in actual corrective work. There are cases on record of atrophied muscles due to infantile paralysis being definitely improved by regular but short swimming periods. Swimming is so individualistic that the swimmer can set his pace at the desired speed.

If there is a reason for believing swimming will develop the body symmetrically it should be strengthened by analyzing the kinesiology of the stroke used in this development. Because of the accepted supremacy of the crawl as the stroke that develops all the muscles, I give it the same place fundamental exercises would take in dancing.

RELIGIOUS EDUCATION

CHARLES M. BRUNSON, *Director, Week-Day Bible Schools, Toledo,* Presiding

AN EXPERIMENT IN RELIGIOUS EDUCATION IN THE HIGH SCHOOL

F. L. KINLEY
Principal, Senior High School, Findlay

The issues involved in the mutual relations of religion and education confront present educators with a problem that is world-wide and of the utmost significance. The widening gap between education and religion is, in the judgment of many clear-sighted and responsible men, one of the primary causes for the present distraught condition of the world. They believe that unless education can again be inspired by religious motives and religion be given a place in education—under the new conditions of modern life and in the light of modern science—comparable with that which religion once held, human civilization is in danger of further disaster and ultimate ruin.

In one respect the public schools are failing to provide the education which American children need and must have, if America is to retain its character as the home of free, upright, and God-fearing people. They are failing with respect to religion. We have placed the emphasis upon civic, social, and industrial aims in public education, as contrasted with religious aims. On the other hand, we have put the public schools at the mercy of minorities in matters of religious conviction.

The practical exclusion of religion from the public schools of this country is fraught with danger. This situation will imperil, in time, not only the future of religion among our people, but also the future of the nation itself. The danger of this is increased by the growth of the public schools and the enrichment of their curricula. The fact is that we have thrown upon the public schools a multitude of new duties.

The philosopher of this movement, as you doubtless know, is John Dewey. For him the end of education is not knowledge merely, or power, but social efficiency, which includes, in a democratic society, the development of individual initiative, responsibility, good will and character. Such social efficiency can be acquired only by actual participation in the life and activities of a democratic society. It is the business of the school, therefore, to foster such a society and to induce such participation on the part of children. The school should thus be a miniature world, of real experiences, real opportunities, real interests, and real social relations. Education is not a preparation for life; it *is* life. Within this school world children learn by working rather than by merely listening or reading; they develop originality, initiative, responsibility, and self-control by engaging in projects which call forth these qualities; they fit themselves for life by living and working together in cooperative, mutually helpful relations. A child learns to do by doing.

Our schools today are fast carrying out the fulfilment of Professor Dewey's theory. It is a matter of far more serious consequence for present-day schools to omit religion than it was for the schools of a generation ago.

We cannot expect the public schools to do the whole work of the religious education of American children. This is for two reasons: first, because complete religious education could not be offered by the public schools without transgressing the principle of a religious freedom; second, because the growth of religion in the mind of a child depends upon a multitude of factors too intimate and too pervasive to be embraced within the limits of organized formal schooling.

However, we must do more in the way of moral and religious education than we have been doing. We can undertake the moral education, including both moral instruction and moral training of the children we teach, by methods more direct, definite, and vital than we have been using. We can aim at a citizenship which is founded upon character. We must manifest due reverence for God and respect for religious beliefs.

It is to meet these difficulties,and a number of others at present facing religious educators, that this experiment or project of religious education is offered. This type of project, which has been introduced into our high school for the purpose of making ideas function in life and guaranteeing Christian conduct, might be classified as that of learning through the use of expressional activities—purposeful activity coupled with a service program. The project is a religious chapel which replaced the old conventional scripture reading and the recital of the Lord's Prayer formerly held in the school study hall.

Two years ago it was decided by the administration that one hour a week would be given to a purely religious service. A group of boys who were leaders in the school formed the nucleus for the first service. This was carefully planned and supervised with a definite religious purpose in mind. A type of program was patterned after a Protestant church service. Athletic heroes prayed, editors of the school newspaper read the Scripture, club presidents offered sermonettes on Christian life, and twenty or more boys offered sentence prayers from the assembly. The effect was immediate; the response was whole-hearted. The fact that this was accomplished by individual students, especially boys, impressed the entire student body. Soon all the various clubs and organizations of the school asked to have charge of some service, each endeavoring to do their best in a purely religious way. This was the beginning of expressional activity in religion on the part of the students.

A description of the organization after a growth of two years may give a more concrete idea of our project. A schedule of chapel services is planned for the entire year, allotted to home rooms, club organizations, and classes of the school. Every student is thus represented in a more or less direct way. The program of each organization is planned under the supervision of a capable sponsor and approved by the principal two weeks in advance. In most cases the participants of the program volunteer. A definite religious theme is always decided upon around which center the hymns, Scripture lesson, prayers, and talks.

The chapel service is exclusively in charge of the students. The chairman announces the hymns, explains the theme, and has general charge of the program. Another reads the Scripture and often offers a comment on the lesson. Another student conducts the prayer service, during which from ten to twenty students participate with sentence prayers. Usually three or four talks on the theme of the service follow. The program is varied with vocal and instrumental music, always of a religious nature. Whatever fitting comments are necessary are offered by the principal. Music accompanies the passing to and from the chapel service which is always done in an orderly manner. Practically no talking is done, and a religious atmosphere prevails to the last.

The foregoing procedure is occasionally varied by the addition of an outside speaker from our local churches. However, this does not replace the activity participation of the students. If a well-known lecturer or prominent individual is in the city he is invited to present some religious theme. The program is often varied by dramatization of Bible stories. At Christmas and Easter a religious pageant is presented. The general character of the programs endeavors to follow the church calendar. The public has been invited to be present and it is not unusual to have forty or fifty citizens present.

We will grant that the results of such a religious atmosphere in the life of every student is a value which is very difficult to measure. However, we can only judge the value of this experiment in the way of character development through careful observation which the faculty has made. The following are noticeable results which we have seen growing in our school for the last two years: evident respect and appreciation for the religious service; raising of the moral level of the school; less thieving, which was particularly noticeable during the previous year; an improved standard of conduct and better discipline because of deeper appeal to the student; cooperation of students of all creeds and denominations, Protestant and Catholic side by side, in divine worship; willingness for students to participate in the activity; and, also, a whole-hearted cooperation among faculty members, and favorable comment of the entire community.

As was previously stated, the central problem of method in the teaching of religion is purposeful activity. It is hoped that the experiment has shown that this actually takes place as those people who constantly observe it, confidently believe.

Moral character is developed through the formation of habits, through experiences, through the actual performance of the pupils themselves. Character is essentially a matter of action, the habitual performance of certain kinds of deeds, and the only genuine way of learning how to do these deeds is to do them. Again we can show that both interest and cooperation are forceful factors in this experiment.

The most encouraging feature of the experiment is the success of the present procedure in the development of expressional activity, interest, whole-hearted purpose, and cooperation; all of which are essential factors for the building of Christian character. The ultimate good is as difficult to measure or perceive as that of any other religious, social, or altruistic activity.

THE CHURCH AND THE PROBLEM OF RELIGIOUS EDUCATION

J. E. Bradford

Secretary of the Board of Education of the United Presbyterian Church of North America

In view of its variant uses, it is well that we agree upon a common understanding of the word, "Church." Without being insistent upon its acceptance, may we suggest the following as a tentative definition? "The church is a religious group instituted for fellowship and service." The church is distinctive from the home, which is the primary social group; from the school, which is essentially a cultural group; from business, which is an economic group, and from the state, which is a civil group. It is granted that each of these has secondary ends and purposes; but—however they may succeed in these secondary ends—if they fail in that for which they were primarily instituted, they fail absolutely. However successful the church may be as a cultural, economic, or social institution or as an agency for furthering civil ends, if it fails in the realm of religion, it fails in that for which it was established.

If the church, then, is a religious institution, a second question is suggested. What do we understand by religion? This question was put to me some months ago by a prominent lawyer in New York, as we sat together at the dinner table. This man was the son of parents who had given their lives to the extension of the Kingdom in foreign lands. He had been trained in the catechism and other religious literature. He was a graduate of a university that had a reputation for sending religious leaders in large numbers into our own and other lands. Theoretically, this man, eminent in his profession, should have had no need to ask a question relative to so fundamental a matter.

The founders of our Government, in drafting the Ordinance of 1787, gave priority to religion over morality and education. It was so highly regarded by the "Father of His Country" that he said in his farewell address to the American people, "Let us indulge with caution the thought that morality can long exist without religion." Those of us who listened to or read the last inaugural address of President Coolidge caught near its end this significant statement, "The promotion of religion is a function of government." It was but natural therefore that my friend should expect me to give a satisfactory answer. I confess, however, that I was caught somewhat unprepared, for it was the first time in all my experience as minister and educator that I had ever been called upon to define this term.

As I recall, the answer that I gave that night was this, "Religion is the reaction of the individual to that which he conceives to be God." While I submit that this definition is defensible, it was no sooner from my lips than I was heartily dissatisfied. I immediately discerned that it did not answer the question that was asked me by my friend. In a dictionary he found this definition, "A belief binding the spiritual nature of man to a supernatural being, as involving a feeling of dependence and responsibility, together with the feelings and practices which naturally flow from such a belief," and this other, "Any system of faith and worship."

Had he looked to philosophy for a definition, he might have discovered this as given by one of the leading thinkers in this field, "Religion is the perception of a moral duty as a divine command." The first was not satisfactory, and the second probably would not have been, to the mind of my friend, and I went from his home that night with the consciousness that he in his hour of need had asked of me spiritual bread and I had given to him but the stone of a theological and philosophical definition.

The next day, as I took my journey from New York to Philadelphia, it chanced that two priests were seated facing me. With the burden of the previous night's interview still on my heart, I asked them how they would define religion. One immediately responded, "Religion is the relationship between man and God." The following day I was seated in the office of the president of an eastern theological seminary who has some eminence for his ability as a definer of theological terms from whom my question elicited the response, "Religion is fellowship with God." I submit to you that these two, the Catholic priest and the Protestant theologian, however they may differ in the manner of expressing their religious ideals, were nearly agreed in the definition of religion.

Some weeks later I was addressing the student body of a western college, and at the close of the address asked the president of the institution, who has a reputation as a Bible teacher, how he would define religion. He replied, "I think I would give Kipling's definition—'Religion is the relation that a man fixes for himself with God.'" I wonder if the poet, with his imaginative spirit, has not added a phrase that is absolutely essential to vitalizing religion? Must there not be the element of self-determination? This is borne out by the fact that though I have proposed this question to persons from the Atlantic to the Pacific, I have never twice received an answer in exactly the same terms.

Turning to the Bible I discovered that so far as the records go, the word never fell from the lips of Jesus himself. It is to be found in the entire Bible only some four or five times. Its most significant use is by the Apostle James, who gives us this definition, "Pure religion and undefiled before God and the Father is this, to visit the fatherless and widows in their affliction, and to keep himself unspotted from the world." According to the writer, religion is something to be lived before God and to be expressed in terms of human conduct toward men.

I have already said that I went forth from my friend's home that night with a great burden upon my heart and a desire to formulate a definition that would be more satisfactory than the one I had just given. Influenced by attendance upon a recent Lake Geneva conference, I endeavored to discover the answer that Jesus would have given had the question been proposed to Him, the Master, rather than to me, his servant and minister. As my mind ranged the whole field of His teachings, I did not then recall any direct utterance that exactly answered this question, but there finally came to my mind two words of His that seemed to give me a clue to the answer He might have given.

The first of these was the call to the four fishermen when He said, "Come ye after me, and I will make you to become." The second was addressed to these same and certain others many months later after He had revealed to them more fully His nature, His teaching, and His spirit of sacrificial service, when He said, "Go ye therefore." These latter words are a part of the Great Commission, which in its entirety reads, "All power is given to me in heaven and on earth. Go ye therefore into all the world, beginning from Jerusalem, and make disciples of all peoples, baptizing them in the name of the Father and of the Son and of the Holy Ghost, teaching them to observe all things, whatsoever I commanded you, and lo, I am with you always, even to the end of the world."

With these two words of the Master in mind, I formulated for myself this new definition, "Religion is a relation of trustful approach to God through Jesus Christ and an expression of this relation in terms of loving, beneficent fellowship and service." I do not insist that you accept this as your definition, but simply suggest it for your consideration.

Now, if the church be a religious institution and religion be as defined, what is the problem of the church? Is it not so to evidence His presence and power in the world through missioning, evangelizing, and teaching that others may be brought into this relation and enabled the more effectively to express their relationship in terms of loving, beneficent fellowship and service?

While we may not hope in the brief time at our command to work out a true answer to this problem in all its parts, we may assume to evaluate some of its factors. One of these is its scope. In what respects does religious education differ from education and from Christian education? Education is the systematic development and cultivation of the natural powers by inculcation and example. Religious education is the systematic development and cultivation of the natural powers by the inculcation of religious truths and principles and the examples of religious life and expression. Christian education is the systematic development and cultivation of the natural powers by inculcation and example and their enduement with the spirit of Jesus Christ.

The agencies for solving the problem are the home, the pulpit, the Sunday school, the week-day school, the vacation school, the young people's organization, the missionary society, the religious press, and personal contact. The direction and integration of efforts, as also the nature of plant and equipment, are factors whose values we may mention but briefly.

The factor of greatest value is that of the teaching personnel. This was evidenced by a recent questionnaire concerning what makes a school Christian. The responses to this gave a relative value of 62 percent to "Life," "Spirit," "Atmosphere," "Objective," and "Fruitage;" 34 percent to character of faculty and teaching; and but 4 percent to equipment and church relation.

The essential characteristics of the teacher as shown by the Master teacher himself are these, winsomeness, kindly ministration, tact in presentation, and appreciation of the best in nature and in man. As required by Him of those who constituted His apostles, these characteristics are as follows: adequate educational prerequisite, discernment of His nature, understanding of the means whereby He revealed Himself, desire to attain, willingness to pay the price, a forward look and readiness to break with the limitations of the past, a world vision that does not overlook the immediate need, a capacity to win and inspire others, and an aptitude to teach. As these same qualifications are in us and abound, they shall make us fruitful in the service of religious education.

In former years I was wont to think that the church had several problems assigned her for solution. For a time the missionary problem, the problem of bearing witness for Christ in other lands, was the one of chief concern. Then I conceived that the greatest problem was that of adding disciples to the church, and so increasing her numbers. Then I was led to believe that the solution of the teaching problem was the matter of supreme importance. More recently I have been led to see that these are all but parts of one complex problem. This is to bring men and women into Jesus' way of life and to enable them more effectively to evidence His presence and power in the world through missioning, evangelizing, and teaching.

SCHOOL BUSINESS OFFICIALS

MORNING SESSION

WARD G. REEDER, *Ohio State University*, Presiding

THE BUSINESS MANAGER OF SCHOOLS AS AN EDUCATOR

G. W. GRILL

Clerk-Treasurer, Board of Education, Lakewood

There is a fundamental difference between managing a large financial or industrial concern and managing the business affairs of a public-school system. As society is organized at the present time, profit is the guiding motive in commerce, industry, and finance. In the field of public education the guiding motive is service—service to the state in making better citizens than would be possible without the public schools, and service to the individual in the countless ways in which he is benefited by the schools.

Many business officials of public schools have been inclined to consider their work as something separate and distinct from the purely educational or curricular work of the system. Superintendents of schools have been guilty of the same error, with the result that in many cities there is a definite breach between the two officials.

It is impossible to separate business and education in the public schools, for every business transaction which takes place in a school system has a direct bearing on the education of the children in the district. It is important, therefore, that the business official have the point of view of the educator.

The business official who is only a bookkeeper sees only figures to be put down in ledgers. As an educator, however, he sees back of the figures children in the process of being educated for intelligent citizenship. When the business official is only a payroll clerk, he sees only a great many thousands of dollars going out each month in pay checks. If he is an educator he sees the pay checks transmuted into happiness, contentment, and efficiency on the part of the teachers. The business official as a typist of bond transcripts may see only a great many pages of closely-typed legal phraseology. As an educator, however, he sees back of the transcript a safe, sanitary, beautiful, fire-proof school building to which many children go, and out of which will evolve a better and more glorious America than we of this generation have builded.

There are some practical bits of education that belong particularly to the business official. It is his task to educate the other employees of the system—superintendent, principals, supervisors—in proper budgeting and budgetary control. It is also his task to educate the new members of the board of education concerning the established procedures, practices and customs of the board, and the fiscal policies set up by law and custom. To educate the public—through newspapers, addresses, and personal contacts—concerning the field of education that falls within his department is also a duty of the school business official.

To become thoroughly efficient, a business official should study education, its objectives, its trends, its history, and its philosophy. He must become infinitely more than a bookkeeper, a typist, a statistician. He must have the larger outlook, the wider horizon, the higher vision, the truer perspective, that he may see the social values behind and in his daily tasks, and the proper relationship to those with whom he works.

A few years ago, John Oxenham wrote,

> To every man there openeth
> A way, and ways, and a way.
>
> And the high soul climbs the high way
> And the low soul gropes the low.
> And in between, on the misty flats,
> The rest drift to and fro.
>
> And to every man there openeth,
> A high way, and a low,
> And every man decideth
> The way his soul shall go.

May we business officials of the public schools of Ohio choose the high way.

THE MAKING OF REPAIRS IN THE SCHOOL PLANTS OF DAYTON

John W. Graham
Business Manager, Public Schools, Dayton

Repairs to any school plant may be classified under one of two divisions, first, repairs necessary to protect and preserve the school property; and second, alterations and repairs necessary or desirable to increase the efficiency and convenience of educational operations.

A wise distribution of funds between the two classes is difficult but essential for the most efficient operation of the school plant. In this distribution, and in the execution of repair operations, the officers and employees of the repair division must remember the purpose for which the school plant exists and the fact that repair work is at best a necessary evil. In Dayton we have adopted the motto, "We Serve Best When Least Seen."

Educational alterations are included in the annual program in accordance with requests from the individual principals, after these requests have been adjusted and reduced in conferences with the business manager. Plant repairs, other than educational, are based upon recommendations and estimates made by the foremen of the various departments and checked and adjusted by the architect-superintendent.

All operations, except those of an unusual character, are carried out by the direct employment of labor and purchase of materials. In several instances where we have obtained comparative figures the cost has been from 20 to 25 percent less than by contract.

The repair division is under the direct supervision of an architect-superintendent. The various foremen in charge of different departments—carpenter labor, electricity, heating and plumbing, painting and glazing, sheet metal and tinning—are provided with light roadsters with pickup bodies to use in moving men and tools. The foreman and laborers are employed on an hourly basis. A carpenter-shop foreman also acts as foreman of transportation. We build a sufficient amount of new furniture to equalize the shop operations. Experimental designs are also developed in the shop. In addition to miscellaneous furniture repairs, approximately three thousand desks are repaired and refinished annually. All major repairs, particularly the overhauling of heating and electrical systems, are completed as far as possible during the vacation period. Hot air furnaces are carefully inspected and broken or burned parts replaced. Linings, arches, and flues in boiler plants are renewed so as to insure operation without interruption during the heating season. More than seven hundred electric motors are overhauled, commutators turned, bearings adjusted or renewed, and armatures tested and rewound when necessary. These precautions have practically eliminated motor troubles during the school year.

The use of the school grounds for community play centers during the vacation period necessitates considerable renewal of window glass. We replaced 1447 panes of various sizes during the past year.

In addition to the regular seasonal repairs, we have just completed an extensive program of major repairs to old buildings. This work has been done by contract. During the past summer, between June 15 and September 1, reinforced concrete corridors and stairways were constructed in four buildings making a total of ten buildings which have been reconstructed in this manner.

Finally, we believe that maintenance should begin with the preparation of plans for a new building. To insure this result the advice of the repair division is furnished all architects and all plans are reviewed by this division before contracts are let. During construction the repair foremen make periodic inspection of all buildings. We are convinced that this practice will decrease future repairs.

THE INSURING OF SCHOOL PROPERTY IN COLUMBUS

W. V. DRAKE

Clerk-Treasurer, Columbus City Schools

When I was asked to address you on this subject, it was with considerable reluctance and apprehension that I consented because of the fact that the Columbus Board of Education carries no fire insurance on its property, with the exception of a small amount on the school and janitor supplies that are in the storeroom. With your permission I shall give a few reasons why we do not carry insurance on our school buildings and their contents.

I believe it is safe to say that no business property in Columbus is watched as carefully for fire hazards as are the public schools. Men from the city fire department make a continuous inspection of the buildings and twice annually a rigid inspection is made by the city and state fire departments under the personal supervision of the fire chief. A report is made of these inspections to the Board of Education with orders to eliminate any hazards that are found. In this connection I might state that such an inspection was made in October, 1926, and the Board was congratulated by the Director of Public Safety on the condition of its buildings and the discipline of its teachers and pupils in vacating the buildings when the alarms were sounded.

No gasoline, coal oil, or other combustible materials are allowed inside or about the school buildings, with the exception of those used in the laboratories for instruction in chemistry. Only "safety matches" may be used. The oiling of floors is not permitted. Boilers are inspected semi-annually by the Hartford Insurance Company. Chemical fire extinguishers have been placed in convenient and conspicuous places. Several of the old type buildings have been provided with fire-proof stairways and other fire hazards eliminated. New buildings are of fire-proof construction. Prior to the World War we had only six buildings that were entirely of fire-proof construction; we now have seventeen of this type and three under construction. To six of our schools new additions or separate units have been built of fire-proof construction. Fire-proof stairs have replaced the old wooden stairs in nine of the non-fire-proof buildings. This represents fairly good progress toward the elimination of fire hazards, but there still remain thirty-one buildings that are entirely of non-fire-proof construction.

In passing, I want to say that while I have been asked to approach this subject from the angle of property insurance, no amount of insurance can replace the lives of teachers and children that might be lost through fire, and it behooves each board of education and each community to keep this fact constantly in mind and to eliminate fire hazards as rapidly as possible.

The Collinwood fire, which occurred in 1908, stands out most vividly in the minds and hearts of Ohio people, I am sure. In that fire nearly two hundred children perished. They had been taught that if they followed the rules of their fire drill they would be safe in any emergency, and had on previous occasions vacated the building in a minute and a half.

Due to the policy of the board of education in providing ample play area for the pupils, the hazard of fire from adjacent buildings has been largely eliminated. The use, however, of frame portables which has been necessary in some sections of the city, constitutes somewhat of a hazard, especially when set up close to school buildings of non-fire-proof construction.

I recently submitted a statement showing the replacement cost of each of our present school buildings and the estimated value of the contents to J. A. Yonkers, assistant manager of the Ohio Inspection Bureau, who very kindly consented to furnish the fire insurance rates on an 80 percent basis from the information they had on file in regard to the hazard of each individual building. The total figures are as follows:

Total replacement cost of buildings	$13,988,700.00
Contents of buildings (estimated)	1,333,000.00
Total valuation	$15,321,700.00
80 per cent of valuation	$12,257,360.00
Annual premium (approximately)	$ 30,000.00

Over a period of thirty-five years there have been only four small fires in Columbus public schools, the total damage to buildings and contents being about $13,000. This sum is far below the amount that would have been paid out in premiums if fire insurance had been carried, and while our favorable experience does not necessarily indicate that it is inadvisable for us to carry insurance on our buildings and contents, I believe that, after taking into consideration the facts given, that we would not be justified in paying out the enormous annual premiums which would be required for protection against loss by fire. The best way to meet losses that might occur is by the plan of the Cleveland Board of Education, that is, appropriating a fixed amount each year until a certain sum is reached.

THE SECURING OF SCHOOL ARCHITECTURAL SERVICE IN ST. LOUIS

R. M. Milligan

Commissioner of School Buildings, St. Louis, Missouri

Of all the professions, that of the architect is least understood by the laity who presume to know more about his business than the architect himself. An architect is required to be a structural engineer, a heating and ventilating engineer, an electrical engineer, and a mechanical engineer, acquainted with the basic principles of all the trades engaged in building construction. He must be somewhat of a lawyer and an artist. All the new devices and methods that come out must be familiar to him. He must know the uses and functions that the building, its parts, and appliances will be put to after its construction. A knowledge of the qualities, values, and adaptability of materials going into the construction is necessary as is also an ability to estimate the amount of labor required.

Formerly the architect was looked upon in many sections of the United States as a more or less necessary adjunct which could be dispensed with in most cases. Such a great change has come over our country in the last few decades in a greater realization of the true worth of the professional services of an architect that he is now accepted by society as a necessary evil, which gives value in the services it renders.

Blackstone in his famous *Commentaries* says, "He who undertakes to be his own lawyer has a fool for his client." One who essays to be his own architect usually purchases at a very high price an imperfect knowledge of some portion of the building art.

Among all the business relations into which men enter, there is none, perhaps, more complex than that which is involved in the construction of a building. There is necessary the cooperation of a multitude of contractors, journeymen, dealers in materials and appliances, and the supervision of an architect, employed by the owner of the land on which the building is to be erected. It speaks for the general honesty and good faith with which such operations are carried on, that there are scarcely any two classes of men whose legal status, in regard to other people, is so undefined as that of architects and builders.

A peculiar triangular relationship exists between the owner, the architect, and the builder. The owner employs an architect as his agent to use his professional skill in preparing the plans and specifications, to supervise the letting of a contract, and constructing of the building. After seeing that the contract is properly entered into he looks after the interests of the owner, being a disinterested arbitrator in the interpretation of the plans, specifications and workmanship, even though he may at times disagree with the owner's opinion.

The contractor signs the contract in good faith and attempts to carry out the work embodied in it according to the supervision and interpretation of the architect. An architect may be employed to render professional services in the following ways. First, he may be hired at a given salary, payable by the day, week, month, or year; second, he may be engaged to do a given piece of work at a fixed sum, either expressed or implied; or, third, as is more usual, he may receive a percent of the cost of construction carried out under his charge.

His engagement to render services in either of these ways forms the subject of a contract between the architect and the owner. A piece of work requiring more than a year to perform should be in writing, otherwise there would be a violation of the Statutes of Frauds which appear, in some form or other, on the statute books of all states.

Employment by advertisement and competition.—Formerly, a common method of selecting an architect was by advertising for competitive bids. This method is dangerous and naturally has fallen into disuse.

It has been held by the courts that a competition induced by an advertisement or circular, when complied with by a competitor, becomes a valid contract, not subject to the provisions of the Statute of Frauds. A common subterfuge taken by unscrupulous architects is to wait until the time for submitting bids has nearly expired, when most of the competitors have completed their drawings, then ask for an extension of time and induce the owner to make some alteration in the terms of the competition. Other competitors who have nearly completed their work in good faith are entitled to remuneration for this work which, by the amendments or changes, in the terms of the competition, is rendered useless. Frequently incompatible conditions are incorporated in the terms of the competition, such as fixing the price in one clause and in another clause demanding an amount of accommodation which cannot possibly be had for the sum named.

Selection of an architect by competition is the most unsatisfactory method. Modern school architecture has become highly specialized and technical, and none but specialists should be considered. A specialist may be employed on a percentage basis with satisfactory results. In selecting an architect on that basis, however, careful consideration should be given to training and experience, the kind of work constructed under his direction and the satisfaction of the client.

When employed under this plan, the architect should be given full confidence and cooperation by the board and the instruction department, and in technical architectural matters his advice should be followed implicitly. An architect employed on a monthly or yearly salary basis in the larger cities has been found to be highly satisfactory, but the same care should be exercised in selection under this plan as under the percentage plan.

In employing the architect on a salary basis, remarkable results have been obtained by giving him other responsibilities than just the architectural service. Maintenance and operation of plants after construction place upon him a realization of the practical uses to which the plant is put; make him feel a greater responsibility for the perfection of the planning and construction of the plant; and enable him to acquire a familiarity with the use to which the building and its equipment are subjected, that he can attain in no other way. The old adage that the baker should be required to eat his own cake holds good with the architect.

Responsibility of the architect.—An architect, under the law, is required to use reasonable care and skill in the practice of his profession, but absolute perfection in such practice is not expected. It has been held by the courts that an architect cannot guarantee absolute accuracy in the workmanship of the mechanics employed under his supervision, nor can he be held liable therefor. The builder is alone responsible for his own misfeasance.

The architect employed on a percentage basis may be required to pay such additional costs as are necessary if errors in the figures or the strength of the structural parts of the building are shown to have been in the plans and specifications thus necessitating tearing down or altering the work. When an architect is employed on a salary basis the owner cannot recover for additional costs entailed through mistakes in the plans and specifications.

The architect as the agent of the owner.—For the purpose of rendering architectural services, the architect is the agent of the owner to a limited extent. An architect cannot change a contract between the owner and the contractor, or the plans and specifications, after the contract has been properly signed, without consent of both the contracting parties. It has been held, however, that, as agent for the owner, he may order extra work done where the safety of the building requires and the owner will be held liable but he has no right to order extra work done for purely aesthetic purposes without the owner's consent.

An architect, within his own province, like any other agent, cannot delegate his authority to any one else. While the utmost respect is generally shown by the courts for his discretion where he has conscientiously exercised it, his mere arbitrary caprice cannot be enforced upon anyone.

ARCHITECTURE IN THE BOARD OF EDUCATION OF THE CITY OF ST. LOUIS

In 1897 a special statute applicable solely to St. Louis was enacted by the Legislature of Missouri. This statute we term our charter. By it is delegated to a Board of Education, elected by the people of St. Louis, full legislative powers entirely separate and apart from the city government.

This Board consists of the heads of four departments—instruction, building, finance, and auditing. Within the building department is placed the custody of properties, architectural services, construction, maintenance, plant operation and all unforseen duties not particularly contemplated. Architectural services fall entirely within this department.

As the head of the building department since 1914, I have been the sole architect of the Board of Education. There has been no advisory or consulting architect employed as has been rumored from some quarters, and the present organization of the building department is my own. In the department the heating and ventilating engineer, Mr. E. S. Hallett, is one of the very best in the United States. The structural engineer is of exceptional ability, and the electrical engineer and sanitary engineer are both of the highest ability. In addition to giving advice in preparing plans and specifications for new buildings, alterations, additions and repairs, each of these men heads a division of the building department and superintends the mechanics and other workmen in the division pertaining to his particular line.

We have a drafting room in which all drawings and specifications are prepared. We also maintain the following shops: carpenter, sheet metal, painting, plumbing, electrical, window-shade and curtain making, furniture repairing, steam heating, and automobile repairing. All emergency repair work and about one-half of the summer repair work is done by the Board's mechanics on the general principle that "a stitch in time saves nine." Thereby maintenance costs are reduced to a minimum.

The head of the building department has direct personal control of the drafting room. The architectural work is but the smallest part of his duties so only a part of his salary is chargeable to architectural service. Since our building work is paid for out of annual revenues, architectural and construction work is continuous with the natural growth of the city. In this way the architectural organization is not broken up by fluctuation in the volume of new building business. The draftsmen are organized for team work, steadily employed, and trained in our special kind of work and standards. This method of furnishing architectural services makes for efficiency and economy.

Costs of furnishing architectural services.—In accordance with the records of the last six million dollars spent for buildings and equipment, the cost of preparing all drawings and specifications amounts to 1.3 percent of the construction cost. Superintending construction by a local superintendent or clerk of the works on each building costs .9 percent of the construction cost.

In private practice the salary of the local superintendent or clerk of the works is borne by the owner, but in our case it is figured into the .9 percent of cost for superintendence. Ordinarily this low cost of producing architectural service cannot be obtained, but our architect and his engineering staff function in other activities than preparing the drawings and specifications, so only a part of their time is figured into architectural production.

The volume of new work per annum constructed for the

Board of Education in St. Louis averages close to three million dollars. In an educational system averaging much less than one million dollars per annum and leaving no other functions of the architectural organization, it would not be financial economy to maintain a separate architectural division. In quality of service, economies in initial costs, operation and upkeep, however, even though the architectural service in itself may cost more, in the final results an advantage would be gained that could hardly be reckoned in dollars and cents.

School-building planning.—The planning of a building of any character must be governed by the uses the building is to accommodate in order to function efficiently and economically. The data required would be whether the building is to be occupied by a grade school, a junior high, a senior high, or a college; the present, and probable future, curriculum of such a school; the probable pupil capacity of the school; the number of pupils in a class unit and a survey of the ground on which the building is to be constructed. A careful study must be made from this data by the architect in collaboration with the superintendent of instruction. Several preliminary studies may be required and a thorough analysis made of each study as to method of construction, arrangement of the departmental divisions in the school, system of heating and ventilation, orientation, design, and last but by no means least, the economies of each in school administration, operation, maintenance, and initial outlay.

Design.—The psychology of the external design of any building should reflect the purpose for which it has been built. A hospital building should by its external appearance indicate a hospital; a hotel should indicate a hotel, and a school building should indicate a school building, so that the passerby would not ask "What is that building?" A school building should be scholarly, refined, dignified, flexible, free from stiffness in appearance, and harmonious in the colors and texture of materials employed in its external design. The proportion of its parts should be in scale one with another. One of the most usual tendencies in design is over ornamentation.

A reasonable amount of aesthetic ornamentation relieves the sense of awkwardness and stiffness. If proper care is exercised in a studied design, as to proper architectural forms and proportions, an excessive amount of ornamentation will be avoided. Usually excessive ornamentation is employed to cover up faulty design. Interior design in school buildings should exhibit a sense of richness in form, color and texture, with practically no projecting ornamentation. For sanitary reasons the finish of the rooms should take on the complex of hospital construction in the selection of materials and absence of moldings or lodgments for dust and other impurities. If perfect and economical janitorial service is expected careful attention must be given to the design of the rooms and fixtures installed. To procure a noiseless school building we use cork carpet for floors throughout the building. This material has resilient, acoustical, and sanitary qualities. Shoproom design should carry with it a shop atmosphere, the psychological effect of which is very noticeable upon the pupils.

All parts of the building should present an atmosphere of cheerfulness, cleanliness, and comfort. Window areas, of course, vary with the local climatic conditions of the country. In St. Louis schools the window area equals about one-fifth of the floor area. In the extreme southern part of the country the window area required could be much less, and in the extreme north it should be much more. The color of walls and window shades in a classroom should prevent eyestrain and improper distribution of light.

One of the most vital functions of the school plant is wholesome and healthful heat and ventilation. Within the last decade school-house heating and ventilating have been revolutionized. Old standards and fallacious theories have been overthrown and new standards have been set up. Every state has enacted pure food laws, and every municipality has spent money in purifying its drinking water, but until recently practically no thought was given to the purification of the air we breathe. Man can live for forty or fifty days without food; he can live a week without water, but he cannot live five minutes without air.

The cities having large industries, traffic, and noxious gases have no natural pure air left. The whole atmosphere is contaminated. Unless this air entering the schoolroom has been cleansed and conditioned we are bound to have an ever-increasing number of puny, anaemic school children. In the rural school districts where these impurities have no cause for existence the situation is entirely different. Referring to the condition of air for the city schools, a system that will not wash out the dust particles and other solid matters in the air, eliminate the noxious gases, humidify and revitalize the air, and maintain a desired temperature, has no place in a modern city-school building. The old method of placing a heating element in the room itself and introducing through an open window outside air loaded with dirt, dust, gases, and bacteria found in city streets and alleys, belongs to the middle ages. There is much controversy over systems of heating and ventilating, and to discuss this one subject exhaustively would require more time than could be allotted in this meeting.

The most satisfactory is the full plenum, air-washed, forced ventilation, recirculated and revitalized by an electro-ozonation system. The initial and operating costs are both less than the ordinary system of radiation in the room. We have no selfish interests in whether any other school uses this system or not, but we could not be induced to step backward into the other systems.

Landscaping.—Considering the money expended, there is probably no one phase of school-building construction which is of greater educational and civic value than proper landscaping and floral adornment. In treating the main facade, the architect expresses the aesthetic ideals of his profession, but as architecture tends toward rigidity, the softness and pliability of foliage greatly enhance the composition.

Architecture furnishes the high lights and deep shadows, while foliage supplies the halftones. Many a well-designed piece of architecture has been ruined by indiscriminate, heterogeneous planting. On the other hand, a carefully studied scheme of foliage massing may be made to cover bare wall spaces; to form vistas leading to important axial points in the architectural design; to give a friendly, inviting welcome to the portals, and to soften the base lines.

AFTERNOON SESSION

R. H. WATERHOUSE, *Business Manager of Akron Schools*, Presiding

THE RELATION BETWEEN THE EDUCATIONAL AND THE BUSINESS DEPARTMENTS IN SCHOOL ADMINISTRATION

A. L. HEER
Michigan State Normal College, Ypsilanti

It is well, at the beginning of this discussion, to attempt to state just what we mean by "educational and business departments." Because of the overlapping of the educational and the business activities, it is impossible to make a clear-cut distinction between these two departments. However, so far as this discussion is concerned, educational department will refer to that portion of the school organization whose functions are to administer, supervise, and give instruction; to take the school census and enforce the attendance laws; and to administer the medical and other welfare activities of the school. The term, business department, will refer to that portion of the school organization whose functions are to provide housing, equipment, and supplies for the educational department together with the financial and business accounting.

When we study the forms of school organization in respect to the administrative relationships between the educational and the business departments, we find three distinct types of organizations, namely, the unit, the dual, and the multiple organization. The unit type of organization is that type in which the board of education employs one executive who, under the direction of the board, supervises the affairs of both the educational and the business departments. The dual type of organization is that type in which the board of education employs two coordinate executives, one to administer the educational department and one to administer the business department. The multiple type of organization is that type in which the board of education employs three or more coordinate executives. In this type of organization one executive administers the educational affairs and two or more administer the business affairs.

To make clearer each of these types of organizations, let us note a city of each type. Detroit is chosen as an example of the unit type. In Detroit the superintendent of schools is the chief executive of the Board of Education. He supervises not only the educational activities of the elementary, junior, and senior high schools but also all of the business activities of the schools. Chicago is an example of the dual type. Here the superintendent of schools supervises the educational department, while the business affairs are supervised by the business manager. The city of Pittsburgh is given as an example of the multiple type. Here there are four coordinate executives, each responsible directly to the Board of Education. These executives are the superintendent of instruction, the superintendent of buildings, the superintendent of supplies, and the secretary of the Board.

We may well ask, "Why do we have all of these types of organization?" To show one contributing cause, we will trace briefly the development of school administration in the United States. The first free schools were established in Massachusetts. These schools were established primarily for religious purposes. With this as an objective, it was but natural that the church and the clergy had much to do with the control of the schools. Gradually this control was shifted from the church to the town officials. As the schools developed the town officials appointed a "school committee" to provide for the schools. As the schools increased and the duties of this committee became more numerous, the duties were divided and assigned to committees, such as a committee on buildings, a committee on teachers, and a visiting committee. As the schools continued to grow and as the administrative duties of the committees continued to increase, some of the duties were delegated to individuals who gave a part or all of their time to performing such duties.

Thus, step by step, our present school boards and school executives were evolved. At first the board delegated only a few of its prerogatives to persons with special qualifications for the duties delegated. Some of the duties of the board of education became so complicated that it required an expert in the field to carry them out. Someone was needed who could supervise and unify the instruction and so the superintendent of instruction was appointed. In some cases a superintendent of buildings was appointed to relieve the board of the care of the buildings. In still other cities a purchasing agent was appointed to relieve the board of education of purchasing supplies. As these executives were appointed to perform duties formerly done by the board of education, it was but natural that the board of education felt that these executives should be responsible to them.

To be more specific, let us briefly trace the development of the school organization in Pittsburgh and Cleveland. The first legislation for the establishment of free schools in Pittsburgh was enacted in 1835. According to this legislation each ward in the city had its own board of education. This board made provision for the buildings, bought the supplies, levied the taxes, and hired and fired the teachers. Each board had supreme control of the schools of its ward. This situation continued until 1855. At this time it was seen that someone was needed to supervise and unify the instructional program of the city.

Legislation enacted in 1855 provided for a central board of education. This board hired the superintendent of instruction and levied the tax to pay the superintendent and the teachers. However, the ward boards continued to hire and to fire the teachers, to build their own buildings, and to buy their own supplies. As unbelievable as it may seem, this situation continued until 1910.

In 1910 legislation was enacted which abolished the ward boards of education and established a central board which was to provide for the schools of the city. As soon as the ward boards were abolished it became necessary for the central board of education to assume the responsibility for the buildings and the supplies. For the Board of Education to do this directly was out of the question. The superintendent of instruction had been functioning for fifty-five years and the duties and routine of his office had become well established. The Board did not desire to place any more responsibility upon the superintendent of instruction.

To provide for these two new functions which the central Board had to assume, namely, the care of the buildings and the purchase of supplies, two new executives were appointed. A superintendent of buildings was made responsible for the care of the buildings, and a superintendent of supplies for purchasing and distributing supplies. To whom should these new executives be made responsible? Since they were performing duties which formerly had been performed by the ward boards, they were made responsible to the central Board of Education. Thus, today the city of Pittsburgh has four coordinate executives to administer its schools.

Cleveland has a history which is of greater significance to the group here assembled because it was here that a plan of dual administration was developed which, with some changes, is the legal plan for the State of Ohio today. In 1892 there was developed in Cleveland the plan of school administration known as "the Cleveland plan" or "the Federal plan." This plan was provided for in special legislation enacted for the city by the General Assembly of Ohio. The law attempted to separate the legislative and the executive powers which were exercised by the Board of Education. To accomplish this it provided for a school council of seven members to be elected at large for a term of two years. It further provided for the election of a school director who was also elected for a term of two years. The school council was the legislative body while the school director was the executive officer. The relationship which existed between the school council and the school director was similar to that which usually exists between the city council and the mayor of the city.

The school director could attend all meetings of the school council. He could debate on any question but did not have the right to vote. However, all acts which involved the expenditure of money, purchase, lease, or transfer of property, the levy of any kind of tax, or the change of textbooks were subject to his veto. The school director nominated the superintendent of instruction, subject to the confirmation of the school council. The superintendent of instruction, in turn, was empowered to appoint and to remove all teachers and supervisors. The superintendent of instruction was subject to the school director and made all reports directly to him. The tenure of office of the superintendent was during good behavior.

All other employees of the school system were nominated by the school director. The director accepted and rejected all bids, approved the purchase of supplies, passed upon the fitness of all employees, and was charged with the execution of the rules and regulations of the school council. He was the real executive head of the schools. He was to devote all of his time to his office and was to receive a salary of five thousand dollars per year.

The origin of this plan is not only of great interest but also of great importance to us. Concerning its origin, Andrew S. Draper, who was the first superintendent under this régime, writes as follows:

> It may be of interest to us to know that the school bill was prepared by four men, three of them lawyers, of whom one was then on the bench; the fourth was the president of one of the city banks. In previous years the bank president had rendered valuable service in the school board. While all were men of affairs, they claimed no expert or professional knowledge of schools, and they made their bill without the assistance of the school superintendence or the aid of the volumes of the Proceedings of the National Education Association.

This plan attracted a great deal of attention and discussion but so far as I have been able to determine it was not adopted by any other city. A committee in Chicago was studying school administration about 1898 for the purpose of recommending a plan to the Chicago Board of Education. William Rainy Harper was chairman, but he did not think well enough of the Cleveland plan to recommend it for Chicago. The plan continued in Cleveland until 1904, when a Supreme Court decision made all special legislation in the State of Ohio unconstitutional. A number of cities were without provision for education. When the General Assembly met the Cleveland plan in a modified form was adopted as the plan for the cities of Ohio.

It is to be noted that this law was framed by four men, only one of whom had had experience in the management of schools. It is also worth noticing that the plan was not based upon any accepted principles of organization nor was it the outgrowth of an experiment; it was the creation of four well-meaning men. Later it was not made a state law because it had proved itself to be the most efficient type of organization, but because it was enacted in an emergency when all old legislation had been swept away by a Supreme Court decision. The present law in Ohio was not arrived at by a study in which the cities concerned participated, each bringing its contribution to make a law which would give the State a generally accepted and efficient form of organization.

We can see that these cities, by a sort of a trial-and-error method, evolved their own form of organization. What was true in Pittsburgh and Cleveland was true in numerous other cities. The resulting forms were empirical products rather than the result of careful study and investigation. This variety of individual effort of cities accounts, in part, for the variety of organizations found today.

The educational theory of the time was another contributing cause. During the last twenty-five years of the past century the theory of formal discipline controlled the educational procedure. This theory of education did not demand any great amount of equipment or supplies. All that was needed was to provide an opportunity for the child to exercise his faculties something like an athlete develops his muscles through use. This theory of education has long since been disproved but the form of school organization growing out of it still continues.

Another reason for the separation of the business and educational functions was the fact that the layman generally considered the superintendent of schools as one who knew educational theory but one who had no business sense. Many times such an opinion was, and perhaps still is, justified. Also, some of the older superintendents of schools thought supervision of business affairs beneath their dignity. With such attitudes on the part of the laity and school superintendents, it is easy to see why the business affairs were separated from the educational department.

Three forms of organization have been mentioned. How widespread are each of these forms? While making a study of this question during the school year of 1925-1926 I had occasion to study all cities in the United States with a population of twenty-five thousand or more inhabitants. Replies with sufficient data to classify them were received from 206 cities. Of this number, 116 were of the unit type, 48 of the dual type, and 42 of the multiple type. No one of these types is confined to any particular size of city. For illustration, New York is of the unit type, Chicago of the dual type, and Philadelphia of the multiple type. On the other extreme, Mountclair, New Jersey, is of the unit type; Kearny, New Jersey, of the dual type, and Clifton, New Jersey, of the multiple type. Each of the last three cities, according to the 1920 census, had a population of less than thirty thousand.

A study was also made on the legal status of the administrative relationships between the business and the educational departments. This study revealed that six states made the superintendent of schools the chief executive officer of the board of education. These states are Alabama, Iowa, Massachusetts, Montana, New York, and Rhode Island. Five of the states made the dual type or the multiple type compulsory. These states are Illinois, Indiana, Kentucky, Pennsylvania, and New Jersey. Several states make the type of organization optional with the board of education.

In spite of the legal requirements of the states, other types of organizations than these required by law are to be found. In Ohio the cities of Columbus, Akron, and Dayton have unit types of organization. While the state of Pennsylvania requires a dual organization, Williamsport and Lancaster have unit types of organization. The same is also true of Mountclair, New Jersey.

Within the past ten years there has been much discussion concerning the merits and the demerits of each of the above types. At the present time there is no objective evidence upon which to base a decision as to which is the most efficient type of organization. Each has its proponents and each has its opponents. For each type numerous arguments have been advanced, both pro and con. The burden of the arguments for the unit type is that the so-called business activities are in reality educational activities; when the business activities are separated from the educational department their administration is likely to interfere with the educational program; the dual and multiple types are conducive to "passing the buck" and do not fix responsibility; and in the dual organization the physical side of the school is maintained at the expense of the educational. The only arguments which I have heard advanced against the unit type of organization is that the superintendent of schools is not a business man and does not know how to administer business affairs; that under the dual and multiple type a more efficient business administration will be secured.

As further evidence of the superiority of their favorite plan, its proponents will proceed to point out cities where an efficient organization of their particular brand is functioning. When this is done, and it may easily be done, it is still not the kind of evidence upon which we wish to base conclusions. These persons who defend some particular type of organization by pointing out a city which is functioning efficiently forget that the success of any organization depends more upon the *personnel* of the organization than upon the *form* of the organization. Any form of organization will function efficiently with a high type of personnel.

There is no unanimity of opinion among business managers, superintendents of schools, and professors of school administration as to what the administrative relationships should be. A little more than a year ago I sent out a questionnaire to secure the opinion of some of the leaders of types of organization mentioned. Their opinions are given in Table I.

What other evidence have we which will throw some light on the situation? We could turn to school surveys, but all of these are made by educators and the recommendations would be likely to be biased. So we must pass the surveys. Happily we have several studies which have been made on city-school systems and some recommendations concerning them which have not been made by educators. Three of such studies will be cited.

TABLE I

Opinions as to Whether Business Departments Should Be Responsible to Boards of Education or Superintendents of Schools

Individuals Giving Opinions	Responsible to Board of Education	Responsible to Superintendent
Business managers in:		
Dual and multiple cities.......	4	3
Unit cities..................	1	3
Superintendents of schools in:		
Dual and multiple cities.......	7 (5 records and accounts only)	7 (5 all except records and accounts)
Unit cities..................	3 (records and accounts only)	6 (all except records and accounts)
Professors of School Administration...............	2 (1 records and accounts only)	10 (2 all except records and accounts)
Total........................	17 (10 records and accounts only)	29 (10 all except records and accounts)

Note: Data in the table are not given as argument either pro and con for any particular type. It does show a lack of unanimity of opinion in quarters where our educational administrative leadership is found.

In 1915, the Mayor of Boston asked the Finance Commission to investigate the great increase in the cost of education in Boston. Among the phases suggested for study was the question of administrative relationships. The Finance Commission secured J. H. VanSickle, who was at that time Superintendent of Schools at Springfield, Massachusetts, to make the investigation. After the data had been collected and given to the Finance Commission, the Commission in turn made a report and some recommendations to the mayor. The following are the recommendations which bear upon the question under discussion:

> That the superintendent of schools be made the chief executive officer of the School Committee; that the business agent be made responsible to the superintendent of schools; that the secretary of the School Committee report to the superintendent; that the schoolhouse custodian be made subordinate to the superintendent.

The Citizens' Bureau of Milwaukee, in 1927, made an investigation and reported to the board of education on "the reorganization of the Milwaukee school board." Since the report is lengthy only a part dealing with the question of administrative relationships will be given:

> The business manager should conduct the affairs of his office entirely under the direction of the superintendent of schools, and with distinct responsibility to him. The manager's office under the plan suggested in Chart III would not be less important than at present, as he would still have every opportunity to make a large contribution to the efficiency of the school system.

In April, 1922, the Board of Education of Cleveland appointed a committee of citizens to study the management of the school affairs of the city. After a thorough study of the situation, this committee made a report to the Board of Education. Only that portion of the report dealing with the position of the business department is given:

> It is the opinion of the committee that this absence of single-headed executive control for the operation and management of the city-school system is the outstanding defect in school organization. To the presence of the dual-headed—in fact, three-headed—executive organization can be traced the cause of the major criticisms that may be made of public-school management in this city.
>
> The committee, believing itself appreciative of the reasons, historical and practical, for this system of "dual" organization is convinced that the time has come for the board of education to seriously consider the establishment of a single-headed executive management of the school system. Such a change might be effected in either one of two ways.

These two ways are then suggested by the committee. The first plan is to make the superintendent of schools the chief executive officer. The second plan suggests retaining practically the same departmental organization which then existed and to subordinate all of the departments, both educational and business, to a chief executive officer to be appointed by the board of education and to be designated as a "Commissioner of Education."

Here we have the report of three investigations made by persons other than educators. In each of the three cases the committee recommended the unit system of organization. And strange to say in each of the three cases the advice of the committee was ignored. I have been unable to find a single investigation of a school system that has been made within the last fifteen years where a dual or a multiple type of organization was recommended.

Some time ago I had occasion to study how the business functions in the dual and in the unit organizations were initiated. The study revealed that the unit or the dual form existed as a pure type in only a few cases. Even in the dual organizations many of the functions of the business department were executed upon direct orders from the superintendent of schools or by directions of the board acting upon the recommendations of the superintendent. The business manager of the unit type seemed to have as much freedom as the business manager of the dual type. The study also showed that there were few purely business functions. Most of the activities of the business department had the characteristics of both education and business.

After a study of these three types of organization I was led to conclude that, other things being equal, the type of organization is best which provides the least opportunity for the development of friction within the personnel and for the evasion of responsibility. The unit type of organization meets this condition to a greater extent than do either the dual or the multiple types. In further defense of the unit type I propose the following reasons:

1. The unit type of organization provides for centralized control and responsibility, the first principles of good management. These principles have been recognized by all committees of laymen that have investigated the problems of school administration within the last fifteen years.

2. The principal purpose of the school is to educate the child. Any factors affecting the education of the child should be under the direction of the individual who is held responsible for that education. The so-called business activities to a great extent affect the educational program

and so should be under the direction of the one who is responsible.

There is one condition, however, which I would like to attach to my conclusion concerning the superintendent of schools assuming that he is the chief executive officer. Good management requires the delegation of functions. The delegation of a function should carry with it the responsibility of faithful execution and the necessary authority for its execution. The superintendent of schools must be big enough and broad enough to delegate functions to his assistants and to give them executive authority. It should not be his business to direct in detail the execution of the function. If the superintendent does not work this way, he will not be able to function smoothly in any type of organization and is a misfit as an executive. Finally, the success of the unit type of organization will depend upon the good sense, the good judgment, and the executive ability of the superintendent of schools and of his immediate assistants.

RÉSUME OF THE LEGISLATION PASSED BY THE PRESENT LEGISLATURE OF INTEREST TO SCHOOL BUSINESS OFFICIALS

C. B. Ulery

State Department of Education, Columbus

Very few measures affecting the work of school business officials have been introduced in the present season of the legislature. A wide variety of general school measures has been proposed but very few measures have as yet received approval of both houses. The following are representative proposals before the legislature:

H. B. 1. Krueger:

Provides that the total bonds issued by a school district without vote cannot exceed one-tenth of 1 percent of the tax valuation.

H. B. 2. Keifer:

Adds two school holidays, Lincoln's Birthday and Armistice Day.

H. B. 19. Van Fossen:

Gives boards authority to purchase school supplies and provides for their sale to pupils.

H. B. 80. Jones:

Provides for a 15-mile limit for political subdivisions without regard for the various present interior limitations.

H. B. 165. Mardis:

Relieves boards from paying assessments for public improvements along school property which was recently required by a Supreme Court decision.

H. B. 169. McCune:

Requires display of flag over or within all school houses while school is in session.

H. B. 191. Cramer:

Authorizes boards to own and provide homes for janitors, teachers, principals, and superintendents.

H. B. 192. Cramer:

Provides certain additions and amendments to the law permitting boards of education to set aside five cents per pupil as a service fund to be used in paying expenses of members of the board when sent out of the city to promote the welfare of the schools under their charge.

H. B. 229. Mooney:

Covers the certification of teachers and aims to clarify existing laws. Superintendents, supervising principals, special supervisors, elementary supervisors, and critic teachers as well as regular teachers will be certified under this bill. Local certificates will be obtainable by examination only. Teachers with two-year normal training receive a one-year certificate without examination and if successful in first year of teaching, a four-year provisional certificate.

H. B. 268. Ehrlich:

Authorizes boards of education of city school districts of 200,000 population or more to employ their own attorneys.

H. B. 366. Rush:

Requires boards of education in small cities to be composed of five members instead of from three to seven members as at present.

S. B. 9. Lewis:

Gives state aid to public schools used for practice-teaching purposes by colleges maintaining departments of education approved by the State Department of Education for the training of teachers.

S. B. 34. Collister:

Provides that when territory is annexed to a city or village it shall not become a part of the school district unless this question has been submitted separately to the electors.

S. B. 41. Collister:

Authorizes boards to provide pension funds for school custodians. Passed and allowed to become a law without the Governor's signature.

S. B. 115. Wise:

Specifies that no bank shall receive deposits of school funds greater than its capital stock and surplus.

S. B. 121. Gillen:

Provides for an equalizing levy of 5.75 mills operative within county school districts and practically eliminates taxing authority of local boards of education. Provides for distribution of funds derived from such 5.75 mill levy by county board of education according to definite schedule covering salaries of teachers and current operating expenses. Provides for state aid to counties in which equalizing levy is insufficient to meet schedule.

S. B. 268. Waitt:

This bill makes sixteen years the upper age limit for compulsory school attendance.

THE PURCHASE, STORAGE, AND DISTRIBUTION OF SCHOOL SUPPLIES IN CLEVELAND

JAMES F. BROWN

Commissioner of Supplies and Transportation, Cleveland

In my ten years' connection with the Cleveland Board of Education, various methods for the purchase, storage, and distribution of school supplies and books have been tried and discarded. The present method of delivery of supplies once each eighth school day from a centralized warehouse has been in effect since September 1, 1921, and is the only practical method which we have used that will deliver the things needed for education when they are required without waste or excessive clerical effort. Our method is comparable with the procedure which will prevail in any large commercial jobbing house.

An outline of the procedure is as follows:

1. A perpetual inventory is maintained with stocks controlled by established minimums and maximums. This perpetual inventory is the basis of the entire procedure. It starts with an inventory; requisitions are deductions therefrom; receiving reports additions thereto. The stock on hand must be in agreement with the balances shown by the perpetual inventory.

2. A catalogue is available to the school system and carries stock numbers and descriptions. Throughout the entire procedure all commodities are designated by catalogue stock numbers and descriptions. Schools requisition one commodity on a requisition which is sent to the warehouse with a duplicate copy. Orders are filled from these requisitions and the two copies are priced and extended. The original is filed in the warehouse perpetual inventory cabinets and the duplicate forwarded to the Division of Accounts to be charged against the budgets by schools and activities within the schools as may be indicated by the budget code on the requisition.

3. At the end of each month the Division of Accounts mails to each principal and each custodian the priced duplicates which have been charged to the school during the month. The feature is in the nature of an itemized bill.

4. Each space on the perpetual inventory cabinets carries what is known as a price record card. This tabbed card shows minimum and maximum quantities in view all the time, and when the stock balance of any commodity shows at or below the indicated minimum, the price record card is removed from the cabinet. A purchase requisition is written from this card in the quantity placed thereon by

the storekeeper; the requisition is then submitted to the Bureau of Purchases accompanied by the price record card. After considerable use, this card will indicate all prior purchases with the name of the merchant, price, quantity, total value, date of issue of requisition and date of receipt ot goods. In time it becomes a very valuable source of information.

5. As soon as the order is placed a copy of the purchase order and the price record card with all new information inserted are returned to the warehouse by the Bureau of Purchases. The card is returned to its proper space in the perpetual inventory cabinets, and a copy of the purchase order is given to the receiving clerk for attachment to his copy of the purchase requisition. This forms his live file of incoming material.

6. When the material is received, inspected and accepted, the receiving clerk makes out a receiving report which he attaches to his copy of the requisition and copy of the purchase order. He then closes his live file and forwards the three papers to the warehouse bookkeepers who insert the receiving report in the proper space of the perpetual inventory cabinets and check the purchase order copy. The purchase order copy after being signed for quantity and quality is forwarded to the Bureau of Purchases and is authorized for payment. Most bills are discounted.

7. The Bureau of Purchases is at headquarters and the warehouse is about three miles from headquarters, in the approximate geographical center of the school district. The building is a 100 by 140 feet, mushroom type, concrete construction, four stories high. The separation of these two units has never been disadvantageous. Deliveries are made in trucks owned by the Board.

8. The Board operates on a budget basis. A comparative table of yearly expenditures by schools and activities within the schools, coupled with the proper enrollment figures, is in my opinion the most effective way in which to economically accomplish the expenditure of public funds.

MACHINE BOOKKEEPING FOR SCHOOLS

CHARLES A. TILDEN

Director of Schools, East Cleveland

This talk is illustrated by a series of slides showing various types of forms which follow a requisition received by the business department and the steps necessary for the placing of orders, receipt of materials, payment for same, and the distribution of the payments to the different accounts.

The objective is not to sell any type of bookkeeping machine but rather to prove that by mechanical process there is a great saving of time and actual elimination of errors and a greater availability of records for accounting and statistical purposes. Our experience indicates that about 75 percent of the usual time in posting ledgers is saved and there is a corresponding economy in eye strain and physical effort on the part of the bookkeeper.

The system is especially adaptable to cost accounting, keeping stock records, and distribution of accounts of every nature. As time goes on, we are finding the machine is being used more and more as a time saver and we are discovering means to adapt it to almost every kind of work except the actual writing of orders and correspondence.

SELECTING, TRAINING, AND SUPERVISING SCHOOL JANITORS IN ST. LOUIS

R. M. MILLIGAN

Commissioner of School Buildings, St. Louis, Missouri

Until recent years, the public-school janitor has been considered of minor importance in the educational organization. His primary qualifications were docility, a weak mind, and a strong back. His training consisted of exercises in standing without hitching and asking no questions. So long as he kept the building warm, emptied the waste-baskets, and swept the floor he was considered an efficient janitor.

The public-school janitor is not the only pinion in the great educational machine that has undergone complete transformation. The school plant itself, methods of instruction—both mental and physical—sanitation, and health hygiene have been completely revolutionized. The school building of a quarter of a century ago, even in our more enlightened communities, consisted of an enclosure, orientated in such a way as to receive light from all directions, heated often as fashion, with little attention paid to uniform temperature, air movement, distribution of heat or humidity. The floors were swept by a broom raising great clouds of dust which became a carrying vehicle of all kinds of disease bacteria. An ordinary tin drinking-cup hung on a nail beside a faucet or an ordinary water bucket. No attention was paid to chalk dust being scattered throughout the air in the classroom. Sufficient room for recreational play was found only in some vacant lot.

The modern school building in this same community is now provided with a complicated heating and ventilating system. Air is washed, filtered, vitalized, and propelled by mechanical means through ducts to each classroom in exact and constant amounts, temperature is thermostatically controlled within two degrees, and positively ventilated so as to produce an air movement bathing the whole room and its occupants.

The floors and chalk rails are cleaned by vacuum machines, which carry the dust, germ laden, outside the buildings instead of stirring it up with broom and duster. The ancient tin cup has passed away and bubbler fountains, giving forth mechanically cooled drinking water, have had their advent. Materials have been selected and the finishing of the school building has taken on more of the complexity of modern hospital construction, thereby obviating lodging places for dust, dirt, and disease germs. Large playgrounds are provided, as are well-equipped gymnasiums which are essential in the modern conception of recreational requirements. Large and well-equipped shops and laboratories are provided for manual training, domestic science, and so forth.

Modern plumbing and plumbing fixtures require more intelligent care than the old style outhouse. Modern door checks and door holders, requiring intelligent attention as in contrast to no attention at all, prevent slamming of doors and general disturbances. Synchronizing clocks and dismissal bells in each room are now considered a necessity instead of the old hand bell with which many of us are familiar.

Formerly, about all the school janitor knew concerning combustion was to shovel in coal until the fire box was full and if the steam pressure became too high, to open the furnace door until the water in the boiler cooled. In these days of efficiency and economy in all industrial pursuits, we have found that the handling of a modern school plant comes within the category of important industrial pursuits and that the operator of such a plant must know all the fine points of perfect combustion, the qualities and idiosyncracies of various classes of fuel used, and the most efficient methods of handling the various kinds of steam generating and air warming furnaces and apparatus. The operator should understand the value, characteristics, and composition of varnishes, pigments, and cleaning compounds in use.

The wider use of school property for evening schools, social centers, parent-teacher associations, educational entertainments, and evening festivals on school grounds, and in the buildings by civic and other organizations, increases the duties and responsibilities of the school janitor. The tendency is to make the schoolhouse the center of many community activities. At such times the janitor must render polite and pleasing service sometimes under circumstances and situations most trying. He must be a diplomat as well as a servant.

The janitor is required to assist the teachers in exercising supervision over playgrounds during recreational periods, and over the basement and toilet rooms. In case of an accident to a pupil he is the first person called to render emergency aid. He must be a sort of a foster-father to the children. This service requires another personal characteristic. He must understand and love children.

The janitor's responsibilities rest with him twenty-four hours of the day and three hundred and sixty-five days of the year. In extremely cold weather he will be required to assume full responsibility for the plant even though it may mean all-night and Sunday service to prevent damage by freezing.

A good public-school janitor should possess the following primary qualifications: first, good moral character and good habits; second, loyalty to the institution and the community he serves; third, physical ability to perform the services required; fourth, an amiable and courteous disposition and a steady, persistent attitude toward work; and fifth, an education equivalent to the first eight grades in a public school.

Many articles have been written on school janitor problems, some of which lay down iron-bound rules of micrometer exactness of man-hours, man-power, and enforced idleness in the janitorial service. Nearly all of these theories, more or less idealistic, sound well on paper, but in real practice do not work out well, principally because no differentiation has been made between an intelligent human being and a machine.

Zoologists would classify a public-school janitor as a biped, mammal of the genius Homo; in other words, a man. Being classified in the general scheme of nature as a man, he should be considered and treated as a man, with all the responsibilities and interests that go with an intelligent human being, and not with a missing link next in rank above the anthropoid ape.

It has been my observation that nearly all the causes for inefficiency and neglect in janitorial service are traceable to the departmental head having jurisdiction.

Not everyone applying for such a position has the primary qualifications, and but few of those possessing the primary qualifications, possess the material necessary to make an efficient "head janitor" or, as some term the position, a "janitor-engineer." Sometimes the departmental head is not familiar with all the qualifications of good janitorial service, and, perhaps, is not a good judge of human character, so misfits find their way into the service. The worst enemy to efficient service is political preferment. Wherever this serpent raises its head in the public educational establishment a chaotic condition invariably follows.

The selection of a superintendent over the janitorial forces is of utmost importance. Great care and correct judgment should be exercised in finding a man who has had wide experience in the care and custody of large plants of this character, and has experience and natural qualifications of a leader.

JANITORIAL SERVICE IN ST. LOUIS SCHOOLS

Fortunately St. Louis is favored by special statute with ideal school laws. The Board of Education of St. Louis, as now chartered, has all the powers of a legislative body, entirely divorced from the city government. Its members are nominated by petition and such names placed on a separate non-partisan ballot.

By statute, four executive divisions are created, with an executive officer of the Board placed in charge of each department, with full control and responsibility for such department. There are four departments of instruction, with the superintendent of instruction in charge; building department, with the commissioner of school buildings in charge; finance department, with the secretary and treasurer in charge; and the auditing department, with the auditor in charge. Subsequently, by action of the Board, an auxiliary department was created known as the supply department, with the commissioner of supplies in charge. These are the basic divisions of the Board of Education of St. Louis.

The building department, over which the commissioner of school buildings is the head, is the custodian of all Board properties, furnishes architectural services, construction of every character, and operation and maintenance of plants. Within the scope of operation of plants the janitorial services are furnished.

Appointment of janitors—Induction into the janitorial forces is preceded by a civil service examination, in charge of a commission composed of the commissioner of school buildings as chairman (by virtue of his office) and two other examiners, one of whom must be an assistant superintendent of instruction, and the other a principal of an A-class school, appointed by the president of the Board of Education. These three, constituting the examining commission, may draft such assistance as is necessary to aid them in these examinations.

All candidates for examination must be American citizens, between the ages of twenty-three and forty years of age, and must make written application on a printed form furnished by the building department. When an examination is called, all applicants on file are notified to present themselves at a designated place and specified time. These examinations are divided into three divisions—physical, written, and oral. The physical examinations are made by physicians from the hygiene division of the department of instruction, and consist of examination of the eyes, ears, teeth, blood pressure, heart, lungs, vaccination, height, weight, hernia, and other defects.

The written examination consists of a knowledge of the elements of arithmetic, and the ability to speak, read, and write the English language. In the written application the candidate must give at least three references.

In the oral examination the applicants are taken singly in a closed room where more personal, confidential questions are asked, as for example: Married or single? Living with wife? How many children? Attending what school? And has the applicant ever been arrested or convicted? This examination is intended to give the examiners an opportunity to judge the character, temperament, habits, and general fitness of the candidate.

A grade of 75 percent is required to pass in each of the examinations. In determining the final grade a 100 percent grade in the physical examination counts 25 percent; a 100 percent grade in the written examination counts 25 percent; and 100 percent in the oral examination counts 50 percent in the final grade. The possible final grade is 100 percent of which 75 percent is passing.

The examining commission then places the names of the successful candidates in the qualified list in consecutive order from highest grade to the lowest grade. This list is reported to the Board and is printed in the proceedings of the Board as the authorized qualified list for janitorial services, from which the commissioner of school buildings makes the appointments as required, beginning with the first candidate on the list. Thereafter the appointments are made consecutively down the list.

Tenure of office.—Appointments from the qualified list are probationary for six months, during which time, if a janitor is found to be temperamentally and habitually unfit for the position, he may be dropped from the roll. Within an organization of so many men there will be some absence from illness, death in the family and other unavoidable causes, consequently a few substitutes are necessary to fill temporary absences. The first appointments will be made from the substitute second- or B-class janitor list. When a vacancy occurs in the second- or B-class janitor forces permanently assigned to a building, a substitute B-class janitor is assigned to fill the place. There he remains until a vacancy occurs in the substitute A-class or head janitor's force when he will again be promoted. From the substitute A-class his next promotion is to an A-class or head janitor with charge of a school plant. After the first six months of service a janitor cannot be discharged except for cause and after a fair trial. This general scheme of employment and promotion gives a practically permanent tenure of position. The turn-over in our service is very small and the men who have been long in the service and whose efficiency and dependability have been lowered are employed in the high-school buildings, and other places where high pressure plants and operating engineers are also employed. In such places the janitorial forces have nothing to do with the heating and ventilating plants; so nothing but housekeeping, and so forth, are required. You may ask why, other than from a humanitarian standpoint, these old men who have lost efficiency are retained? I know the educational institutions are well paid by the increase in moral and proprietary interest stimulated in janitorial forces when they know they have a permanent tenure even in old age, and that their services have been appreciated even by a public corporation.

Training.—It would be as unreasonable to expect efficiency from an inexperienced man inducted into the position of public-school janitor, as it would be to expect efficiency from a raw apprentice in a mechanical trade requiring skill. The modern public-school janitor is a skilled workman in a definite trade. To acquire this skill a long period of instruction and apprenticeship is necessary.

Experience has taught us that an apt pupil requires from five to seven years to acquire the qualifications for A-class or head janitorship. With many the qualifications of B-class or second janitorship will be as high as they can attain. The B-class is congested, but there is lots of room on top in the A-class.

Every other Saturday morning we hold a school of instruction for janitors on the board's time for which time the janitor is paid. This makes attendance mandatory when they are ordered to attend. Instruction is given in the regulations of the building department concerning janitorial services; what to do in various emergencies and other rules of conduct about a school building; the nature, use and care of the various janitorial tools, implements and supplies; the nature of woods, marbles, slates, cements, metals, paints, varnishes and other finishes and the proper treatment thereof; the principles of combustion; the nature of various fuels; the proper methods of firing, cleaning, and caring for boilers, and a study of the various types and kinds of boilers, furnaces and appliances in connection therewith; the various types of steam engines, motors, dynamos, fans, ozonators, pumps, refrigerators; and the general principles of ventilation and heat control. In these classes demonstrations are made of the use of janitorial implements, and of cleaning and preserving compounds. This training-school course covers everything which in any way effects janitorial services.

In addition to this training course, janitors are transferred frequently from one school building to another, through our system of promotion. We find this of inestimable value in acquainting the staff with all the various plants, in which almost all known systems of heating and ventilating are employed, from the old-fashioned antiquated window ventilation to the most modern recirculated and revitalized plenum system.

Remuneration.—Since the highly specialized services of a modern public-school janitor require a man of much higher type of intelligence, mechanical tendency and physical endurance than formerly, a much higher scale of wages would naturally be expected. In our system none but married men and preferably those with families are employed. This fact and the present higher standard and cost of living affect the wage scale. Considering the fact that in everything but academic education the janitor must be the equal of the teacher, and in many things her superior, we fix the scale of wages per annum equal to that of a teacher in the first eight grades of an elementary school. Our scale of wages for a substitute janitor is $125.50 per month; B-class, $137.50 per month; A-class, $163.00 per month for twelve months in the year and matrons, $85 per month for ten months of the year.

Sex of employees.—In the janitorial service of school buildings there should be no light or irresponsible jobs; consequently, the majority of the employees are married men as I have said before; however, in every school building containing the seventh and eighth grades, with a pupil population approximating one thousand or more, there should be a motherly-dispositioned woman, preferably a widow with dependent children, primarily for the purpose of being in charge of the girls' playroom, dressing rooms, and toilet rooms as a matron. When not engaged there, as before and after school hours, she should do light work such as dusting, washing glass bookcases and classroom doors, and inside glass of windows.

Habits and personal appearance.—While it is not expected that the janitor shall be a general "flunky" for the teaching staff, he must be courteous and cooperative and must realize that the school is conducted for the purpose of educating pupils. He must be tactful, friendly but not familiar, and at all times ready to render services related to his position. Exercising control over the children or dictatorially interfering with the duties of the children or the teaching staff will not be tolerated.

The janitorial staff must present a clean and neat appearance, and abstain from the use of intoxicating liquors or drugs. Because of example to the pupils, the use of tobacco on the school premises is prohibited. Every janitor and matron is required to have at least two prescribed uniforms.

Social and fraternal cooperation.—In the janitorial forces of the school system of St. Louis there is an organization known as the Public School Janitors Mutual Aid Association, which has a sickness and death benefit, an assurance feature; and also, educational and social features.

About eight years ago we realized that the Federation of Labor was exerting a powerful influence over the janitorial forces in our city, and was liable to cause untold trouble. Working on the theory used in subduing prairie fires, that of starting a controllable fire ahead of the larger conflagration, we organized this mutual aid association in order to satisfy the social needs. Human beings by instinct are animals of a social nature, and this tendency must be satisfied in a most beneficial way, if harmony is to prevail. This Association is organized with a constitution and a set of by-laws. It meets monthly for business and educational purposes and annually for election of officers. An annual picnic is held in addition to the entertainments, socials and dances which are given during the year. The Association has executive, membership, grievance, and entertainment committees and other special committees when needed.

The organization has endured through influenza epidemics, paying all its obligations, and through strenuous influence exerted by labor organizations. It now has about fifteen thousand dollars in the treasury without the members paying as much dues as are required in the unions.

Janitorial supplies.—All janitorial or operating supplies including fuel are purchased after a public annual bidding. Under our specifications samples of the kind of materials bid upon, excepting coal, must be submitted. From the janitor's training school, committees of head janitors are selected to inspect and test the samples on a stipulated day. In the committee reports, a first, second, and third choice must be made. The janitor committees do not know either the manufacturers or the prices stipulated in the bids.

These samples are taken to the school buildings and tested under actual working conditions. Under this system of testing the lowest bid does not always get the committee's recommendation, but we have found excellent results and in addition to saving money, the janitors have had the best supplies and implements for their service.

Care of landscape and grounds.—It is not expected to find botanists among the janitorial staff, although occasionally there may be found individuals who love plants and flowers and have talent in caring for the landscape. We maintain a landscape division consisting of a corps of gardeners supervised by an able botanist with exceptional ability for designing landscape work. All janitors are required, however, to cut, water, and weed the grass; water the shrubbery; and cultivate the ground about the plants.

Economies of a well-trained janitor force.—We have found that a well-trained janitor force not only renders an efficient service, but tends to lower operating and maintenance costs by getting the most possible heat units out of fuel, and by proper use of cleaning compounds, and janitorial tools. Intelligent care of boilers and other parts of the heating system; knowledge of woods and their finishes; knowledge of the nature, structure, and use of marbles, plasters, flooring materials, paints, and cleaning materials all add to the life and appearance of such parts of the building and reduce the cost of maintenance.

A janitor should be able to make minor repairs, such as packing pumps, repairing door locks, and removing stoppage in plumbing, but if the required repairs are beyond his ability in magnitude or character he should notify the department by telephone immediately. If the repair does not require immediate attention, he should write a requisition explaining fully the nature of the repair, so the necessary mechanic can be sent.

SCHOOL LIBRARIANS

HERBERT S. HIRSHBERG, *State Librarian,* Presiding

THE SCHOOL LIBRARY: AN ACTIVE PARTNER

E. E. LEWIS
Ohio State University

The two absolute necessities for good instruction are, first, good teachers and, second, good materials of instruction. Nothing will take the place of a good teacher. Nothing will take the place of an abundant supply of good materials of instruction. A good teacher is badly crippled in her work unless she is supplied with the proper kind and amount of instructional materials. A good teacher uses a larger number of books than a poor teacher, just as a good pupil uses books more extensively than a poor pupil. School officers have spent a great deal of time in working out policies with respect to the securing and holding of good teachers. They need to spend an equal amount of time in the development and establishment of adequate textbook and supply policies.

Present-day creative education believes in pupils' learning laboratories, not teaching laboratories. The emphasis is no longer placed on the imparting and the absorption of knowledge but upon creating learning situations. A school administrator may be best judged by the extent to which the child is given an opportunity to teach himself. A learning laboratory means just what it says—a laboratory in which children may learn. We cannot have a laboratory without laboratory equipment. Laboratory equipment for learning purposes means adequate textbooks, supplementary books, reference books, library service facilities, magazines and visual education materials. Many children are now starved both at home and at school simply because there is no adequate policy of supplying books. Twenty-five years ago our libraries were confined to a few shelves and were only open once or twice a week as a special favor to the gifted children. The present-day conception is library service for all, every minute of the day. The average classroom needs from one hundred to three hundred different titles at hand. This is true regardless of whether it is the first, the fifth, the ninth or the twelfth grade, and regardless of subject. Teachers cost approximately seventy cents out of every dollar spent for education. Books cost less than two cents out of every dollar. Instruction will be greatly improved when we begin to spend three, four, or five cents out of every dollar for instructional materials. The library of the future will not be shut off or shunted to one side in our educational program. Every classroom will be a laboratory and the library will be the most important phase of its equipment. Then the library will indeed become an active partner.

SPECIAL EDUCATION

Francis N. Maxfield, *Ohio State University,* Presiding

SPECIAL CLASSES FOR HANDICAPPED CHILDREN IN OHIO IN NOVEMBER, 1926

J. E. W. Wallin
Miami University

According to 101 replies received in response to a questionnaire sent to the 145 largest cities of the state, at least forty-four cities in Ohio maintain special classes for mentally deficient and backward children, namely, Akron, Ashland, Ashtabula Harbor, Cambridge, Campbell, Chillicothe, Cincinnati, Circleville, Cleveland, Columbus, Dayton, East Cleveland, Elyria, Euclid, Findlay, Fostoria, Fremont, Geneva, Greenfield, Hamilton, Jackson, Kent, Kenton, Lancaster, Lakewood, Lima, Mansfield, Marion, Martins Ferry, Norwalk, Norwood, Piqua, Ravenna, Springfield, Tiffin, Toledo, Troy, Van Wert, Warren, Washington Court House, Wooster, Youngstown, Zanesville, and Xenia. This list includes all of the twenty-five cities of more than twenty thousand except nine, namely, Canton (87,091), Lorain (37,295), Portsmouth (33,011), Steubenville (28,508), Newark (26,718), Sandusky (24,500), Middletown (23,594), Alliance (21,605), and East Liverpool (21,411); and all of the twenty-five cities between ten thousand and twenty thousand except twelve which are Barberton (18,811), Massilon (17,428), Marietta (15,700), Bellaire (15,061), Ironton (14,000), Niles (13,080), Kenmore (12,428), Coshocton (12,100), New Philadelphia (10,718), Bucyrus (10,500), Salem (10,305), and Urbana (10,300). Only thirteen of the forty-eight cities of from five thousand to ten thousand have special classes for mentally deficient and backward children. Good as this record may appear to be, especially in view of the fact that no state aid is provided for these classes, the fact remains that most of the mentally deficient and very backward children in Ohio are still retained in the regular grades.

Not more than half a dozen cities in the State possess adequate facilities for satisfactory examination and differential diagnosis of mentally deficient and backward children. The vast majority of cities are not populous enough to support adequately staffed and equipped clinics, and must depend upon state or county clinics. Ohio maintains a state clinic for the examination of mentally handicapped school children. This is the Psycho-Educational Clinic of the Bureau of Special Education of Miami University, which, since its establishment in 1921 has made about thirty-five hundred individual examinations in over seventy school districts in all sections of the state except the extreme southeastern, including a mental hygiene survey in almost every school district in Miami County. The examinations of the Bureau have yielded suggestive data regarding the incidence and distribution of mentally deficient and backward children in the schools of the State, and have led to the establishment of special classes in more than a dozen cities, and stimulated the growth of such classes in many other cities. Many other cities would have established classes had state aid been available. If Ohio is to grant state subsidies for the education of handicapped children, the Act must be extended to include the mentally handicapped instead of being restricted to the physically handicapped. To make this possible the rates for the latter type must be reduced.

CONSERVATION OF VISION IN PUBLIC-SCHOOL WORK

Estella Lawes

Director of Classes for the Blind, Cincinnati

Sight saving might be discussed from many angles. I am taking only points of general interest to teachers. It is almost unnecessary to speak of the value of sight in education. With the emphasis which is being placed on visual education, attention has been called repeatedly to the large percent of concepts which come through the eye gate. Educational approach is so largely visual that it is essential for impressions received in this way to be correct. It is surprising how faulty a child's concepts may be, when vision is defective. Because we are interested in the ideas and impressions which our pupils are receiving all the time, we cannot fail to be vitally interested in the avenue by which they come.

We know that there are no absolutely perfect eyes, but impaired vision of such degree as to constitute a health defect, is considerable. Gulick and Ayres in *Medical Inspection of Schools,* rank defective vision as third among physical defects found in school children. In the book, *Conserving the Sight of School Children,* a report of the joint committee on Problems in Health Education of the National Education Association and the American Medical Association, and published by the N. C. P. B. the statement is made that about 12 percent of the school children in the United States have defective vision. A number of years ago an extensive study was made in Germany which showed very definitely that near-sightedness increased from the lowest to the highest schools, and that the increase was in direct proportion to the length of time devoted to the strain of school life. At the University of Pennsylvania a similar study was made of the eyes of 883 students which seemed to concur with the findings of Cohn in Germany. It is interesting to note that the defective vision among the university students who came from private or city schools where the eyes were properly protected was less than among the students who came from rural communities where accurate refraction is impossible and the care of the eyes neglected.

To be constructive in our efforts we must start our work before vision becomes defective. No child who attends school can be omitted from consideration in carrying out a program for conservation of vision. The eyes of every child must be protected and where vision is faulty it must be corrected. School children fall into four groups in considering protection and correction. The largest group are those whose vision is normal and who need to be protected so that they may go out from school with eyes just as strong and healthy as they were on the first day of school.

The boys and girls who are apparently normal in every way are often passed by in consideration of physical defects and yet they are the children who should receive the major part of our consideration in this respect. We compel children to come to school and we control the conditions under which they work. It is essential in maintaining vision unimpaired, that right working conditions be given to them throughout their school life. This protection is the school's greatest responsibility in saving sight.

Defective vision comes from two main causes: first, from disease, and second, from refractive errors which may be congenital or result from improper use of the eyes under working conditions, dim light, glare, poor type, or bad posture. Conservation of vision is one part of a general health program, and is primarily in the hands of the school doctors and nurses. This does not relieve the teacher from a certain responsibility. She sees these children every day, the doctor or nurse may be able to observe them closely only a few times in a school term, and it is often the teacher who senses the thing that is wrong and refers the case to the doctor or nurse for action.

Disease conditions.—Often eye difficulties are a symptom of general health defects. In the case of tuberculosis, for instance, the eyes may be seriously affected, and it is only with a cure of the tuberculous condition that the eyes are made normal. Parents should be warned that with eruptive diseases such as measles, scarlet fever, and chicken pox, the eyes as well as the bodies are sick and the patient should be kept in a well-shaded room, and not be allowed to do close work while he is convalescing. With syphilitic infections, both eyes and ears may be seriously affected and the most important thing to do in these cases is to see that the child has treatment regularly, for with successive attacks permanent scar tissue may be formed on the eye. A general health education will do much toward preventing visual defects caused in these ways.

Physical conditions.—It has been suggested that the physical conditions under which our children work are eye hazards in many cases. Take for instance the question of schoolroom lighting. Our children sit in the schoolroom day in and day out and often no attention is given to the light in which they work. There are school rooms in Ohio where light is coming on the children's work from opposite sides of the room. I know a city school in which half of the rooms have light entering from the north and south at the same time. There are schoolrooms, too, where the children sit facing windows through which the glaring sun comes at certain times in the day. Surely teachers know that at all times the light should fall on the work which is being done and never directly into the eyes of the pupils. Natural lighting is best controlled through the use of translucent window shades. The best type of shade is one in which two rollers are fastened at the middle of the sash, one curtain pulling up and one curtain pulling down. On a bright day the lower curtain may be drawn to protect the children who sit nearest the window, from the direct rays of the sun, while the top shade is lowered so that the light coming in is reflected downward from the ceiling to the farthest corners of the room. Either the teacher or some dependable pupil ought to be responsible for the readjustment of window shades whenever necessary so that with the change in the position of the sun or with an approaching storm the window shades may be readjusted to conform with light conditions outside.

On dark days work should be given orally or proper artificial light provided. The lighting of schoolrooms is best handled by a competent illuminating engineer who will take into consideration the size of the room, the reflective value of the decorations, and the needs of the children when making his plans. Under no circumstances should open bulbs be hung in any room. The source of light should always be placed within a diffusing globe. Glare from open lamps is one of the most serious causes of eye strain and where children are required to look into an unshaded lamp for any length of time actual eye deterioration may result. The extreme example of this is the acetylene torch which is used in welding and from which at all times the worker protects his eyes. If a school cannot afford to be relighted according to modern methods, it can at least purchase frosted bulbs to place in the outlets. This affords somewhat of a protection from glare. Between glare and gloom there is a happy medium in which the children can work efficiently without endangering their sight.

Just at present we are hearing a great deal about the socialized recitation. The children are gathered together in groups, in circles, or around tables. There is always a certain percent of the children who sit facing the light or with their backs directly to the light, so casting their own shadows on the books. At Dallas several weeks ago, a man who was considerably interested in sight conservation said it seemed to him that these socialized recitations were most unsocial so far as eye protection was concerned. This does not imply a criticism of the socialized recitations, but it does mean that when they are taking place teachers should be conscious of the effect which the bad position may have on the children, and so arrange her groups or the window shades so that no serious consequences may result.

Considerable interest is being shown by publishers as to the kind of type to be used in textbooks. They agree that a glaze on the paper often is a source of reflected glare to the children and that attention must be given not only to enlarging the type but to providing better spacing between words and lines. This interest is extending itself into types of writing as well.

Print is probably the most legible medium for presenting ideas. There has been a tendency to disregard legibility for speed in writing and we see in some schools fine slanting writing with a good deal of shading on the down stroke. This may be beautiful but it is certainly difficult to read. Lately there has been some attention given to manuscript writing or running print, as it is often called. In England this type of writing has been taught in the lower grades for a good many years. It has the advantage of being legible and in acquiring it children need only two concepts of a letter—a capital and small.

Correct seating and posture also are factors in sight conservation. Children should be taught how to hold their books and papers not only as a health measure but because such training leads to the establishment of right habits in eye hygiene. School executives and business departments are largely responsible for the furniture which is being used in public schools, and should be made aware of the health problem which is being met in their use. Especially bad is the high polish which is found on so much school furniture. It is a definite source of glare. School furniture, walls, and woodwork should be finished with a flat surface which means a dull or wax varnish. This will eliminate glare to a great extent. A good many people have advocated having the desk tops adjustable so that in reading they may be raised to a slant. This encourages the children to keep their books at the proper angle in front of their eyes. They ought not to be allowed to let the books lie flat and cramp their chests and bend their heads closely over them.

In the points discussed up to this time we have been considering the child whose vision is perfectly normal and who needs protection in many respects to keep it so through his school life. There is a second group of children in the schools whose sight is defective but who, by corrective measures, can be brought to normal. These children need correction as well as protection. They are found mainly in the routine examinations by the doctor and nurse. The ordinary procedure is to send them to an oculist for careful refraction. When glasses have been procured or the treatment prescribed careful follow-up work should be done in each case, to see that the glasses are kept clean and straight, replaced when broken, and prescribed treatment followed.

Even in communities where there is a school doctor or nurse, many of the eye cases are discovered first by the teacher. This comes because eye difficulties develop between the routine examinations made by the school doctor, or because children are omitted or absent at the time the round-up is made. The first children who come to the attention of the teacher are those who are reading failures—children, who at the end of the first grade, have not made any noticeable progress in reading. If the children have been given a mental test and have been found to be of average intelligence and still do not learn to read we may suspect that defective vision is playing some part in their lack of progress. In the upper grades children who do poor written work, yet do fairly well in oral studies, sometimes fall within this classification too. Children with defective vision uncorrected are notoriously bad writers and bad spellers. They do not distinguish the e's from the o's, the m's from the n's, the b's from the h's, and o's from the g's, and in order to cover up their lack of definite knowledge scribble the words so that the letters may be interpreted in almost any way. Some eye defect may be suspected when children hold their books close to their eyes or when they complain they cannot see the writing on the blackboard. This may be due to the poor writing that the teacher is doing or the glare on certain portions of the blackboard space, but if the child has been tested in several seats in the room and cannot see what is written he should have the attention of an ophthalmologist.

Teachers should concern themselves with the child who is cross-eyed. It is commonly thought that children outgrow crossed eyes but ophthalmologists tell us that it is not true. What is happening is that only one eye is being used, and after a certain length of time the other eye deteriorates from non-use and becomes blind or very nearly so. After the weaker eye is blind it straightens up because there is no necessity for its making any effort to see. So much of the time children who are using one eye, or who are blind in one eye, do not realize their own condition. Every effort should be made to provide treatment, very early, for these children.

Inflammations in the eye, too, are often noted first by the teacher. Whenever a child's eyes are inflamed or whenever there is any discharge he should be sent immediately to the school doctor for observation. It is not safe, either for this child or for the other pupils in the room to neglect an inflammation of the eye. When boys play so much with air guns, bows and arrows, and so long as we celebrate

Fourth of July in the present manner, it is inevitable that accidents to the eyes should happen. No eye accident ought to be neglected. Attention should be given immediately because the injury may set up an infection which would result in the destruction of both eyes.

A plan is being tried out in Cincinnati by which it is hoped that the teachers generally throughout the schools may become conscious of eye defects and eye hazards, and so assist in the protection of their pupils. One teacher from each public-school building is designated as school representative for conservation of vision. These teachers meet several times a year with the school doctors and nurses to discuss common problems. Early in the year the school representatives assist in an eye survey of the schools and because they are in closer contact with the pupils and other teachers in the building they are able to call the attention of the doctor or nurse to particular cases which may not fall within the regular routine. These school representatives have been greatly interested in the relighting of old school buildings and the provision for proper control of natural light. As a result of their efforts a number of the badly lighted old school buildings in Cincinnati have been relighted and redecorated and the children attending these schools have been given right working conditions.

While the group of children which we have considered can be corrected to nearly normal and can carry on school work in the regular way, there is a group of children with defective vision who even after correction cannot get more than 50 to 60 percent visual efficiency. After they have had the care of an oculist and glasses and treatment have been prescribed, it is not profitable to have them continue in the regular classes. These children are essentially sighted children but require so much individual attention in the grades and are so handicapped by the small type in the books, that they do not progress normally even though they have average intelligence. Some of these children would be endangered by continuance in classes with children whose vision is normal. Constant reading of fine print and the use of their eyes in the many activities of the regular grade would cause the vision to deteriorate considerably. These children need to be protected. They need to have correction as far as possible, and at the same time they are entitled to an education equivalent to that which any other child in the community is given. These children are put into what is known as a sight-saving class. About one in every five hundred of the school population needs this attention. The attendance of this type of child in a sight-saving class relieves the regular teacher from the necessity of giving an undue amount of time to the child with a physical handicap. It relieves the school system of repeaters who fail because vision is faulty. By giving attention to vocational guidance as well as special education this group is made an asset rather than a liability to the community.

The standard of work maintained in a sight conservation class is exactly that of the school in which the class is established. It may be carried on in an elementary school, junior high school, or senior high school. Sight-saving methods may be applied to a college as well as a class for backward children. Sight-saving methods are universal in their application and the basis of their application is the mental ability of the child under consideration.

Probably one of the most important considerations which supervisors of sight-conservation classes have to deal with now is the training of teachers for this work. The teacher in charge of one of these classes should be a successful teacher of normally sighted children. Thus she will have acquired a sound basis of educational methods. It is necessary only for her then to be able to apply these principles to the needs of the child who is visually handicapped. In order to do this, training should be given to her in eye hygiene and in the application of general methods to her particular problem. The organization of sight-saving classes presents a rather definite problem in administration and in a six-weeks' course which we feel is absolutely essential in the preparation of teachers for sight conservation class work, daily observation in a demonstration class is considered fundamental.

Teaching methods and class organization cannot be discussed fully in the limits of this paper. Probably the most hopeful thing in the forming of classes of this kind is the close supervision of the ophthalmologist and the careful teaching which together enables a large percent of the children to return to the regular grades with eyes improved—a condition which has been brought about at the same time in which they have been making normal school progress.

When the visual efficiency of a child falls below 10 percent, he should be taught by the use of Braille. A child of this type forms a definite problem, both in education and in vocational guidance. He is not to be confused with the child in a conservation of vision class, who is essentially a sighted child, and must be treated as such. A Braille class does not form the essential part of a sight-conservation program in the public schools.

In a far-distant province in China the road to the principal city wound its way down a steep hillside. Every day travelers losing their footing plunged down the cliff. Many were injured and killed. At last the kind villagers said, "Let us build a great hospital at the foot of the hill to take care of the injured and as a fine monument in memory of the dead." One man wiser than the rest said, "Would it not be better to build a wall at the top of the cliff, so that these fatal accidents may not occur." And the good people marveled at his wisdom.

It is not enough for us to provide an education for children after vision has become so defective that a special training is necessary. We must see to it that every child has an opportunity to obtain his education without endangering his eyes.

TRAINING FOR THE UNSTABLE CHILD

J. B. Miner
University of Kentucky

The organic conception of human behavior implies that all the processes of the organism are interdependent. A disturbance of intellect, emotion, or movement affects more or less each of the other phases of behavior. Moreover, if we consider the relation of knowing, feeling, and willing to the nervous system, we may understand how a general condition of the nerve cells in a particular organism may explain a type of disturbance of all phases of behavior. It is probably not too fanciful to assume that the nerve cells in different organisms vary as to their stability. In some people the cells are more unstable, more easily discharged, and more variable in their responses from moment to moment. This excessive instability of the cells may be native or it may be acquired through prolonged or sudden strains to which the nervous system has been subjected. We note it as a temporary phenomenon in connection with fatigue. This conception affords an approach to the problem of the diagnosis and care of a group of cases which is especially troublesome. Often these individuals have low but sufficient intelligence, as shown by brief tests, to get along socially. They are, however, so unreliable, so irresponsible, so variable in their responses that they cannot be trusted in ordinary situations.

This conception of the varying stability of the nerve cells from individual to individual may possibly throw light also on the curious instability occasionally found at the high end of the distribution of tested intelligence. It may be that the instability at the high and low ends of the intelligence range, while showing certain similarities in responses, may be due biologically to quite different causes. The variability of nerve-cell action at the upper end is conceivably related to cells with adequate energy for ordinary situations but finely and delicately organized, cells which are evolving toward more complex types, in which socially valuable variations and mutations are likely. With such cells, original and creative work might be expected and yet they might not be able to stand the higher intelligence strains which mediocre brains escape. On the other hand, instability at the lower end of intelligence may be connected with deteriorating, degenerating cells which are weak under ordinary strains. Under this conception, the presence of instability, irregularity of test results, and individuality of responses at both extremes of intelligence may be harmonized and understood.

The unstable individuals of low intelligence are rather common. They are often called psychopathic or functionally disturbed. They form a socially troublesome, and yet hopeful, group which feeds the delinquent and irresponsible class. If groups of such cases were gathered together might not a special kind of care and training be developed to meet their needs? In this country, classes for incorrigibles, private hospital schools, and the colonies in New York State for placing out high-grade deficients by the day in towns and on farms could contribute valuable experience to such a program.

Three unusual institutions in Europe offer suggestions on the case of unstable, unreliable individuals who have a low intelligence, but who are not primarily deficient in intellect. At Templin, near Berlin, the German society for child care established an experimental training home, the Heilerziehungsheim, originally suggested by Dr. Ziehen. Here about twenty-five unstable boys, from 7 to 14 years of age lived together under the direction of a sympathetic teacher who had had previous experience in an institution for deficients. He worked at the problem of giving as much freedom and responsibility to each boy as he could stand. There was a daily routine broken into very brief periods for each activity and varied from period to period so as to maintain the children's interest. The removal of strains and repressions combined with this program promised well.

A unique colony for delinquents at Sieversdorf, also near Berlin, placed from seventy-five to ninety in private homes within a distance of four miles. These delinquent, irresponsible young people of both sexes, lived in these homes until they were of age. It is too much to assume that these delinquents were all unstable although their delinquencies suggest social instability. Eighty percent of the boys and 60 percent of the girls turned out well. Some of them married and settled down on small farms nearby which were given them when their probationary period was over at twenty-one years of age. The delinquents were supervised by the able pastor of the parish. Those more than fourteen years old had their own group amusements, such as singing societies and a turnverein. The younger children were brought up as foster children in the families and almost always turned out well. This farming community, numbering about three thousand with eleven hundred living in the village of Sieversdorf, approved of the colony of delinquents and was glad to have the assistance of these able-bodied young people. They were paid a small wage for their work. The environment was ideal for social stability.

The third institution was an experimental small farm home under the direction of Professor G. Cesare Ferrari of the University of Bologna. Known as the Villa Carducci at Imola, Italy, it cared for more than a score of deficient delinquents of both sexes whose own peculiarities were so well understood and guarded by the able woman teacher in charge, that during its four years no serious disturbance had occurred through the presence of both sexes, although a number of the young people were adolescent. Furthermore, none had run away except to immediately return, although the grounds were not enclosed. It was the most striking example of guarding the feeble-minded from their own personal dangers through a remarkable insight as to the special controls needed for each case. Thirty who had been through its training had been successfully placed.

These instances of attempts to guard and train irresponsible youths against the dangers of delinquency contain something of promise for further attention to the special care for unstable children. Such care would include sympathetic understanding of the personal peculiarities, individualized rewards and controls, protection from overfatigue and ordinary strains, routine but not monotonous activities, graded responsibilities, and prolonged supervision. The children of socially passable intelligence, whose main source of difficulty is an unstable nervous organization, will reward attention to their own care more often than will those children of deficient intellects.

TEACHER TRAINING

DAVID ALLEN ANDERSON, *President, Kent State Normal College,* Presiding

THE OPTIMUM PERIOD OF TRAINING FOR ELEMENTARY-SCHOOL TEACHERS

C. W. HUNT
Cleveland School of Education

Despite all reservations by presumably practical persons, expertness in teaching depends in considerable measure upon teacher training. A discussion of the proper length of the course for training elementary-school teachers under the general heading seems appropriate therefore.

The length of the pre-service training period is no longer standardized at any level. The pre-service requirements are in the process of being increased. For example, all the normal schools in New York State, including the teacher-training institutions in New York, Syracuse, and Rochester now maintain three-year pre-service courses for the preparation of elementary teachers. The normal schools in Sioux City, Iowa; Richmond, Virginia; Boston, Massachusetts; Kansas City, Kansas; Rhode Island State College of Education of Providence; and the Cleveland School of Education have the three-year pre-service course in operation. Cincinnati has had a five-year course for some time, not only for high-school but also for elementary-school teachers. A number of other normal schools have established longer courses which may be chosen by the student, as in Pennsylvania and Detroit. The tendency to lengthen the course is also evident in the general policy to cut down as far as possible the number of one-year training classes for rural schools.

I wish to state at the beginning that I shall not advocate any standardized length of course for all situations. The length of the course should and will vary in the future in accordance with the practical possibilities. My thesis may be stated somewhat in this form: Pre-service courses for teachers are being lengthened. This process is both desirable and practical. A four-year course leading to the degree is the desirable standard toward which to work and the three-year pre-service course with the fourth year to be worked out in service offers a practical solution at this time.

The causes for the tendency to lengthen the pre-service training are clearly evident. The elementary school now has the responsibility for a program much larger than the one it had twenty years ago. Particularly in the cities, the burden of giving children an all-around education has been shifted from the home and neighborhood to the school. This cause has its roots in the changed family and community life. Many activities formerly directly experienced in home or community must now be taught with much greater difficulty in the school, if the pupil is to have any appreciation of the industrial and economic processes which go to make up modern life. This requires additional training for teachers.

A second cause or a statement somewhat different from the point of view of the first lies in the increased number of subjects which have come to be demanded in the pre-service course. One unfamiliar with the pressure on our normal-school curricula could fully understand this. A city-training school which sends its graduates into positions from which their inadequacies are very definitely reported back, feels this pressure especially. In Cleveland, before the present three-year course was installed, fourteen different subjects were taught throughout the first semester. None of these could be omitted without raising a plausible objection. The list included principles of art, biological nature study, introduction to teaching, English composition, lyric poetry, speech arts, handwriting, household arts, personal hygiene, use of library materials, elements of music, gymnastic exercises, psychology of learning, and world history since 1800.

To achieve even a modest command of this material required twenty-five periods of classroom attendance each week. The student was thus under the direction of a teacher practically all the time. The units of study were in such small segments that the mind of the student must have been whirling with all this variety of subject-matter. Sound scholarship, deep, and permanent intellectual interests are not thus promoted. These subjects were not placed in the curriculum because of an ambitious faculty, but because of the pressure to send students into the field equipped to meet its new demands.

A third cause for the lengthening of the course comes in the realization that good teaching is the result of being an all-around person as well as a skillful technician in a narrow field. Well-developed intellectual interests and unhurried integration of one's personal forces are essentials in projecting a teacher into a long period of growth in teaching.

Another cause for the lengthening of the program lies in the new conception of method. The modern classroom is a place where children are taught to live not under a strict regimentation where teaching skill involves a command of a narrow subject-matter and mechanical organization, but under a more highly refined social control with a wide subject-matter and a new appreciation of the individual needs of children. This new classroom cannot be directed by persons of poor scholarship or those who are immature in their personal development.

A practical reason for lengthening the course comes with the increase in number of those applying for admission to teacher-training institutions, in other words, a use of the law of supply and demand to secure better-trained teachers. Teacher-training institutions will not be benefited by turning out a larger number of inadequately trained teachers than can be absorbed by our schools. Still another reason comes with the realization that while training is of significance, selection of personnel counts heavily in the quality of teaching. It is only the exceptional student, who has money enough to attempt a college course, who does not choose this avenue. Our teacher-training institutions do not give the coveted degree, do not have the social program, which is equally coveted nor as rich a subject-matter which keen-minded students choose for their personal development.

I have said that the degree is the goal toward which we should work. This is a standard which will attract a higher type of person than we could interest otherwise. There are, however, certain reservations which I wish to emphasize in setting up a degree program for elementary-school teachers. It is an administrative failing to reach out for prestige, regardless of the professional needs. We do not wish to grant degrees because liberal arts institutions have this privilege nor do we wish to choose the present subject-matter of degree-granting institutions because it has traditional academic respectability.

There are two controls in this which should be kept in mind: first, the personal development of teachers of first-rate ability, and second, the professional subject-matter and attitudes which are essential in their work. It has been suggested that the subject-matter necessary for an elementary-school teacher cannot be of enough significance to cover a three-year pre-service course, much less a four-year pre-service course. This attitude toward the problem seems to neglect the facts which I have already suggested.

1. That it takes time for adequate development, scholarship and personality, and that the present time is not sufficient to give us teachers whose initial equipment will insure a high type of teaching and a continued growth.

2. That the subject-matter now required in the specific fields of geography, history, hygiene, and other subjects has been very greatly enlarged, or at least our appreciation of the significance of the thorough command of advanced knowledge in these fields has been greatly increased. The problem and project attacks on subject-matter required a greatly superior control of the particular field and everything related to it.

3. It is, as I have suggested before, quite impossible for an immature teacher to reach the high levels of classroom management which we now know are possible.

Another consideration seems of considerable importance:

Young women may rightfully expect to marry. We do not wish to organize our programs so that our teaching corps would be made up of those who do not look forward to marriage or easily find it possible. It is seriously questioned by sociologists whether a four-year program of training beyond high school with the ensuing professional career which should naturally follow, is good from this point of view: If a young woman graduates at the age of twenty to twenty-two from the teacher-training course, it then becomes possible to spend some five years in the profession during which time she may work out the remaining requirement for her degree through summer session or leave-of-absence, and still marry at a suitable age. The three-year program offers a middle course.

May I add also that the four-year program of training should be organized as a unit, although part of it is completed while in service. It should be so printed in catalogues, that the student sees from the beginning the completely rounded program. This is not the place for a detailed discussion of what should go into this curriculum. I wish only to say now that it does not seem to me to be wise to build a curriculum which would easily enable students to go into high-school teaching positions. The subject-matter should be, in considerable part at least, directly related to the elementary grades and observation and practice should be in the elementary schools. If this is not the case graduates will be inevitably attracted to the high schools by the superior salary schedules now in existence.

A plan which looks forward to the continuance of study while in the profession is in accordance with our current philosophy of what education is. The trouble with high-school teachers has been that they have considered their education completed when the first degree was obtained. If, in addition, they were unequipped with the professional tools for analyzing and understanding the processes with which they dealt in the classroom they usually have adopted bad professional attitudes toward improvement. We accept as a truism now that, if education is anything at all, it sets in motion abiding interests which continue after the close of one's formal education toward a personal and professional development, wider and richer with each year of experience. If we can in some measure secure these permanent interests and attitudes in our elementary-school teachers, we shall have greatly improved a situation which confronts every superintendent of schools.

There are undoubtedly those who will say that it is economically unsound to look toward a widely distributed professional training of three or four years. Those who say this neglect to note the significance of the changes which have already taken place in the requirements of many institutions. The experience has been that the number of applicants increased, rather than diminished with the higher requirements. With the increased prestige of the course sources of supply are evidently tapped, which would have sent their quota to other institutions. If boards of education hesitate to approve an increased period of teacher training because of the probable increase in the salary level for elementary-school teachers, the reply is first that their expectations are probably well-grounded. If we secure a more adequately trained body of elementary-school teachers they will be better paid than they are now. This hesitation also would fail to recognize the dominant interest which all parents have in giving to their children all the known advantages in early childhood. It still remains true that the experiences obtained by children in this period are of the very greatest importance.

As long as favored children are taught by teachers of superior personality and training, there will be a strong tendency to make the general standards approximate those for the privileged. The belief in higher training and gifted personality as necessary for elementary schools involves a faith that our economic resources will be freely spent on this as a worthy objective.

A CONSERVATIVE VIEW OF SOME PROGRESSIVE IDEAS

Payson Smith

Commissioner of Education, Massachusetts

The progressive movement in education is characterized by being interesting, by being creative, and by being active. All these adjectives one desires in his own thinking and doing. Progressive education makes much of the child and seeks to find the way in which he, as an individual, may get his just educational due. With the general ideals that dominate the progressive school of educational thought all must be in agreement.

Those who are engaged in training teachers must understand that the spirit of the new education as set forth in this opening statement will pervade the classrooms into which our young students in training will go as teachers. We certainly must not fail to do what we can to bring them into harmony with the education scheme of which they are to be parts.

Perhaps it would be better to say that we must keep them in harmony with these new ideals because one may question whether, on the score of activity, of likely interest in present-day concerns, or of creative power, there is much that needs to be done to create in a modern student body those characteristics that seem to dominate our time. For my own purpose it would be better perhaps to say that one of the things to be done is to keep, in this interesting active and creative era, a hold upon some fundamental goods that were inherent in an older age and may not be without truer value in this one.

I believe in making the educational process as interesting as possible both to the educator and to those to be educated, but my observation is that much of the work of the world, that many of life's tasks are hard unwelcome tasks that have to be done because they have to be done. My opinion is that youth or adults led to believe that everything in life can be made interesting may find themselves, both as individuals and as a social group, evading their responsibilities when they can, and seeking that which seems easier rather than the better way, when choices of routes lie before them. I am not going so far as to say that you should have in the schools difficult tasks whose only virtue is their difficulty, nor would I divert you from any honest effort to introduce elements of interest into whatever you teach, but I want to bring a bit of comfort to anyone who feels that he is not progressive because he has not succeeded in dramatizing the multiplication table or a lesson in spelling.

I believe likewise in activity. There must be genuine, purposeful activity of some sort if there is to be progress toward a goal. But, again, I have real concern because there has lately come into education what seems to me so much of activity for activity's sake. I lately heard of a superintendent of schools who was dismissed from his post because he was "too busy," an odd charge, it would seem. But, in the words of the chairman of the dismissing committee, this superintendent was "always busy doing things, but never busy getting things done." There may be reason to fear some of the super-activity that pervades an ultra-"progressive" school. I believe in the socialized recitation, but one has doubts of the wisdom of pushing this recitation reform too rapidly when he so often sees recitations of this type in which there is so much more of sociality than there is of recitation.

Take it if you will as an expression of expiring autocracy, yet I say to you that the time has not yet come, all form of student activity and of student discipline to the contrary notwithstanding, when the teacher can abdicate his position as leader, director, and authoritative guide. Those who are charged with the duty of training teachers may not overlook the far-reaching social results of any philosophy they may adopt affecting schoolroom practice. Much has been said in recent years of the necessity that the schools should conform to the changing order, and that they must keep in harmony with current practices outside the school. All that is true enough, but something surely remains to be said in defense of the older notion that education has power to modify conduct. I am with those certainly who would test the modern school on its fitness to belong to modern life, and on its understanding of the significance of modern tendencies. I insist, however, that it remains the duty of the school to examine that modern life and to understand so far as possible its tendencies with a view to finding its own responsibility, either to confirm or perhaps to oppose.

I believe in creative education, but the individual creates out of his possessions and his possessions have come to him from his environment as well as from his native talent. I am skeptical of the results of the creative passion in those cases where there is little or no worthy material with which to work. In fact, you find me this morning feeling that education not only bids the individual to use fully and fruitfully what he has, but that it must provide the individual continually with more materials with which to work. I grant that power grows with the utilization of what knowledge one has, but I insist that there must be at least a little knowledge to start with and that there must be constant accessions of knowledge if constantly richer fruitfulness is to ensue.

Finally, then, I am a progressive. It would not be pleasant even if it were safe to say otherwise, but my plea today is that every reform that is proposed in the name of progressive education should be tested not only as to its progressive character, but that it should frankly face, if you please, what without shame one may call the traditions of education.

Such traditions I shall not state in detail. Of all of them, the most important perhaps to keep in mind is that relating to education as a means of the general diffusion of intelligence among the people. Someone lately declared that the thing to be noted most in higher education today is a waning confidence in knowledge, and a weakening faith in the validity of scholarship. Without more evidence, one may be reluctant to accept so pessimistic a finding. If it be true, however, to any extent, it may be that we—whose responsibility lies chiefly in the lower schools—as well as the public that overloads its schools with certain extraneous tasks, have overlooked the primary obligations of education which are the conservation of knowledge, the discovery of truth, and, of course, beneath all, the mastery of the tools by which knowledge may be obtained and the pursuit of truth may be aided.

THE PLACE OF EDUCATIONAL THEORY IN TEACHER TRAINING

B. H. Bode
Ohio State University

The primary concern of education has always been the conservation of racial experience. In tracing the origins of our present civilization in the records of the past we tend to leave the impression that all the big problems have been solved, that the course of civilization has reached its ultimate fruition in our twentieth century enlightenment. We may not do this with conscious intent but we have not as yet developed an adequate realizing sense that education at the present time is as much responsible for the task of preparing for a future that will be different from the present as for the conservation of past experience.

In vocational education the dangers of a narrow training are becoming increasingly evident. The commercial and industrial life of the world is changing so fast that the vocation of today may disappear tomorrow. Consequently, the need of breadth in training is reasonably evident. This need is equally urgent in matters pertaining to the social environment. Here, too, change is the normal thing, but we are embarrassed by the question of values. What sort of a civilization should we aim at and prepare for? This question is not just a question of fact-finding, since various types of civilization are equally compatible with the results of science. The question is embarrassing because the teacher cannot keep his personal philosophy of life out of the classroom; but, on the other hand, it is regarded as unethical to use the public schools as a means of propaganda.

We are suffering at present from the delusion that all the problems of teacher training can be solved by the paraphernalia of scientific method, such as job analysis, statistics, and the like. If we face the problem squarely it becomes clear that scientific method, however indispensable, does not cover the whole ground. It does not reveal the proper function of the school in a democracy. This is not a question to be solved by a process of fact-finding, but falls within the sphere of educational theory. The function of theory is not to prescribe for the prospective teacher what he is to believe, but to assist him in clarifying his understanding of what is meant by democracy and how the conception of democracy relates to the content and method of teaching. Education is a tool that can be made to serve many masters. It is of primary importance that our teachers should have a definite conception of their function in the social order.

The teacher's conception of his job is the most important thing about him. It would seem to follow, therefore, that educational theory should rank first in the scheme of teacher training. It is true, of course, that abstract theory is mainly worthless, but it is equally true that if theory functions as a social gospel and gives a clue to the interpretation of methods and procedure, it becomes of supreme worth. A consciousness of a social mission is necessary if a teacher is to have a sense of the importance of his job and if he is to have those incentives for persistence and enthusiasm which yield abiding satisfaction and bring out the best that he has to give.

VILLAGE AND CONSOLIDATED SCHOOL SUPERINTENDENTS

A. B. WEISER, *Superintendent of Schools,*
Canal Winchester, Presiding

THE JUNIOR HIGH SCHOOL IN THE SMALL COMMUNITY [1]

J. M. GLASS

Consulting Director of Junior High Schools, Florida State Department of Public Instruction

The 6-6 type comprises an elementary school of Grades I-VI, and a combined junior-senior high school of seventh-twelfth years. This type of organization is advisable for smaller cities, boroughs, and larger rural communities because of the economy in building construction and operation.

Consideration of economy largely determines adoption of 6-6 plan.—Financial considerations make it inadvisable to build and operate separate junior and senior high schools in communities where the secondary-school enrollment in the seventh to the twelfth years is less than five or six hundred pupils. In districts, therefore, where the total population is less than approximately eight thousand, the six-year junior-senior school is generally more economical to build and operate.

Communities of eight to ten thousand population are at the borderline where either a modified 6-3-3 or 6-6 organization may be adaptable to present conditions. Such communities should give serious consideration to conditions of increased population which are likely to develop. In view of a prospective increase in secondary-school population of more than five or six hundred, a 6-6 organization should be administered in anticipation of converting it ultimately into a 6-3-3 organization.

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[1] Excerpts from the *Manual for Junior High Schools*, Harrisburg, Pennsylvania, 1925, 110 pp. (Bulletin No. 14, Pennsylvania State Department of Public Instruction)

The six-year junior-senior high school effects economy in two ways. The first economy is brought about by the fact that certain facilities necessary to both the junior and senior high schools can be used in common. Accordingly, it is necessary to provide only one auditorium, one gymnasium, one library, common shops for industrial arts, common home-economics rooms, common science laboratories, commercial education rooms, one administrative office, teachers' room, health room, and, where necessary, one cafeteria. The economies effected in building costs are clearly evident. Both the junior and senior high schools gain reciprocally by the erection of a common building. A community, therefore, which may have outgrown an older type of high-school building with limited facilities except those of the usual classrooms and which because of congestion in the elementary schools is obliged to remove seventh and eighth grades from elementary buildings and which furthermore cannot afford to build separate junior and senior high-school buildings is offered an opportunity to enlarge its present high school for both junior and senior high-school purposes or to construct a new junior-senior high school. In the latter case, enlarged facilities become possible to both junior and senior high schools by reason of the fact that these enlarged facilities which are impracticable in two separate buildings become practicable in a joint building.

The second economy which is effected in a six-year junior-senior high school results from decreased cost of operation, administration, and supervision. One principal can assume charge of both units. Supervisory officials can direct the classwork of both schools. Members of the joint faculty can give instruction in both junior and senior high-school classes, particularly art and music teachers, industrial arts and home-economics teachers, science teachers, foreign-language, and commercial teachers.

Distinctive and common features of junior and senior high schools in a six-year secondary school.—The initial problem of providing building accommodations for a six-year junior-senior high school is minor in comparison with the major problem of educational reorganization and of a proper regard for the distinctive and common features of junior and senior high-school administration. The natural concentration upon distinctive purposes of the junior and senior high schools which prevails in a 6-3-3 organization because of their separate administration has resulted in a degree of effectiveness in the 6-3-3 plan which largely accounts for its general adoption in large school systems. The same concentration upon distinctive purposes is possible only in a 6-3-3 plan when the distinctive purposes are kept in clear focus.

On the other hand, the common objectives of both junior and senior high schools which constitute all the general aims of a secondary school of six years, that is, the articulation of courses of study, the coordination of instructional and administrative method, the integration of the social, civil, moral, and vocational training of adolescent youth through six years of secondary education, and the realization of the seven main objectives of education, all of these common purposes are likely to be promoted more effectively in a 6-6 than in a 6-3-3 plan. Continuity and articulation in secondary school administration prevail naturally in a six-year junior-senior high school to the same degree that concentration upon distinctive purposes prevails naturally in a segregated junior high school and a segregated senior high school. Consequently, the articulation of the two units is a problem of first importance to 6-3-3 systems and the realization of distinct purposes is similarly of primary concern to 6-6 systems.

Distinctive features of junior and senior high-school administration.—Chiefly, therefore, there is a need in a six-year junior-senior high school to preserve a balance between the distinctive purposes of the two units. These have most clearly been stated by the Reviewing Committee of the Commission on the Reorganization of Secondary Education:

> The six years to be devoted to secondary education may well be divided into two periods which may be designated as the junior and senior periods. In the junior period emphasis should be placed upon the attempt to help the pupil to explore his own aptitudes and to make at least provisional choice of the kinds of work to which he will devote

himself. In the senior period emphasis should be given to training in the fields thus chosen. This distinction lies at the basis of the organization of junior and senior high schools.[2]

The implications of this basic distinction are particularly important to a six-year junior-senior high school. Mainly, the distinction implies two programs of studies, each an integrated and self-contained curriculum organization and both articulated to preserve the continuity of secondary education. The first is an initial stage of "simple aspects" of secondary courses of study and the second is a consummating stage of "refinement." Each is distinct but both constitute an articulated program of secondary education.

The program of studies in the junior period is designed to articulate elementary and secondary courses of study, "to explore aptitudes of pupils, to reveal the possibilities of the major fields of learning" and to initiate secondary or vocational education by intelligent guidance of the first and crucial choice of electives.

The program of studies in the senior period is designed to furnish training in the fields chosen in the junior period, to continue progressively the differentiated curricula which are merely initiated in the junior high school, and to inaugurate in greater detail the educational specialization which will in turn be later magnified in higher institutions or vocational experience.

From another point of view the 6-6 organization is likely to develop into a 6-2-4 organization. The distinction lies chiefly in the administration of the ninth-year curriculum. The ninth year may be administered as the consummating year of the junior high school or as the initial year of the traditional four-year high school. It cannot be administered as both. Either the program of studies of the junior high school or of the four-year high school must prevail in the ninth year.

The purposes of the junior high school cannot be achieved in the two years of the seventh and eighth grades. If this had been possible departmentalized grammar schools of two decades prior to the junior high-school movement would today replace the junior high school. The program of studies of the junior period may be initiated in Grades VII and VIII but the basic purpose of curriculum reconstruction to articulate elementary and secondary education can be realized only when two former years of the elementary school and one former year of the secondary school are administered as a composite and transitional unit of Grades VII, VIII, and IX. Fundamentally this is the reason why 6-2-4 organizations have been converted so universally in large systems to the 6-3-3 plan and why increasingly in smaller system 6-2-4 organizations are being converted to the 6-6 plan.

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[2] *Cardinal Principles of Secondary Education.* Washington, D. C., Government Printing Office, 1918, p. 18. (Department of the Interior, Bureau of Education, Bulletin, 1918, No. 35)

Common features of junior and senior high-school administration.—In the matter of administrative features common to both junior and senior high-school units in a six-year secondary school, economy of operation dictates the following among other common features. There should be one faculty. Teachers should not be designated as junior and senior high-school teachers except so far as temporary distinctions are unavoidable during a transitional period while a common status of preparation and qualifications is being secured and except so far as the major subjects of English, social studies, geography, and mathematics render possible separate schedules for junior and senior high-school teachers. Even in such cases all teachers should have some classroom contacts with both courses of study to the end that teachers may more effectively preserve the progressive continuity of courses of study and methods of instruction throughout the six years.

One chief gain in economy of administration which is effected by a common faculty organization lies in the fact that a specially prepared teacher may be secured by combining junior and senior high-school classes in one teacher's schedule for the work in science, industrial arts, home economics, art, music, foreign language, commercial education, library supervision, guidance counseling, school nurse, and so forth.

Another common administrative feature is the schedule of classes. In a six-year organization both junior and senior high-school classes must be operated on the same time schedule. The administrator is confronted, therefore, with the alternatives of an eight-period schedule of forty or forty-five minutes which has been the universal practice in the high school or of a six-period schedule of sixty-minute periods which is also the universal practice in the junior high school. The choice is in a minor degree dependent upon economy of administration which at a casual glance appears to favor the eight-period day and in a greater degree is dependent upon the type of classroom procedure which the administrator wishes to adopt throughout the six secondary years. The principal who decides to adopt modern "organized classroom periods" or "modern methods in teaching" will have his choice automatically decided for him. The longer period is prerequisite to directed learning and the six-period schedule is in turn prerequisite to the longer period.

A third common administrative feature is the operation of the six-year junior-senior high school under one principal. Matters of attendance, promotion, supervision, measurement of results of instruction, records, admission, classification, and routine matters of organization must be administered in common for the two units. Thus, in respect to purposes and programs of studies, distinctions between the junior and senior periods are necessary. In respect to faculty organization, schedule of classes, and principalship, distinctions are largely unnecessary.

Features of junior and senior high-school administration both distinctive and common.—Certain administrative features exist which partake of the nature both of distinctive and common features. Methods of instruction and of the socialization of the school are a composite of distinctive and common features. To restate the discussion of distinctive and common features it may be said in general that distinctive features relate to objectives and curriculum construction, common features relate to administration and operation, and features which are composite of both relate to method. Method includes socialized classroom procedure, social (extra classroom) activities, and guidance, or, to use a more inclusive term, the socialization of the school.

The socialization of materials, method, and school life is steadily becoming an established practice in the junior high-school movement. This practice will extend, even farther than it has so far progressed, through the whole secondary school. The socialization of the six secondary-school years will become established more speedily in a 6-6 than in a 6-3-3 system. Under a common administration the continuity of instruction and administration will promote more rapid articulation of method in the two secondary schools. It is, therefore, likely that methods of instruction and administration which should be progressive through the six years will find more ready acceptance in a 6-6 system.

Distinctions of method in the junior and senior high-school units will not be drawn between objectives. Rather the distinctions will be relative with regard to initial and later developments of continuous and progressive methods of classroom work, social activities, and guidance. For example, cooperative study of teacher and pupils will characterize junior high-school method of classroom instruction. More independent and home study will characterize the senior high-school unit. Directed learning and socialized classroom procedure will be the common aims of both units.

Social activities will be largely grouped about the home-room unit in the junior high school to the end of giving initial training in social cooperation to large numbers of pupils. Social activities will largely center in the senior high school about the whole pupil-body to the end of providing progressive training in larger social units. Through the six years a continuous and progressive program of junior citizenship will enlist the gradually expanding powers of adolescent youth in the practice of the art of social cooperation.

Guidance will be chiefly educational in the junior high school with the aim of directing the intelligent choices of definite educational or vocational courses. Guidance will be mainly vocational in the senior high school with the aim of motivating concentration upon educational and vocational choices. Both educational and vocational guidance will have the common aim to promote the completion of six years of secondary school work.

Furthermore, both schools should provide a comprehensive and progressive program of personal, social, and moral guidance to the end that right attitudes and habits of personal, social, and moral conduct may be established in the formative periods of early and mid-adolescence. Certain practical considerations should be noted in the administration of socialized classroom methods, social activities, and guidance.

Junior and senior high-school classes will, of course, be segregated for classroom work. The schedule of classes will operate to preserve the distinctions in the progressive development of socialized methods of instruction. Most frequently the principal will need to distinguish the guidance programs of the two units; the same agencies in guidance will be employed, but the method though continuous must be adapted to varying ages of maturity.

Particularly in the social activities program the immaturity of pupils in Grades VII, VIII, and IX cannot easily be adjusted to the comparative maturity of tenth-, eleventh-, and twelfth-year pupils. Home-room work must invariably be segregated. Club work must usually be conducted in separate groups. Assembly programs should most frequently be given before the separate groups except in the case of the smallest six-year junior-senior high schools. School campaigns, large school projects, the student council and similar affairs of the whole school life may enlist the cooperation of junior high-school pupils but these larger enterprises must largely be directed by senior high-school pupils.

Summarizing, methods of classroom instruction and the administration of the guidance and social-activities programs have common purposes in both secondary school units but progressive, and, therefore, relatively distinctive features of development. The administrator of the six-year junior-senior high school should clearly distinguish the initial, progressive, and consummating stages of development in methods of socialized classroom work, social activities, and guidance.

SIX-FOUR: FOUR-YEAR JUNIOR HIGH SCHOOL

The 6-4 type comprises an elementary school of six years—either a one-room or a consolidated elementary school—and a four-year junior high school of Grades VII, VIII, IX, and X. Pupils who complete the tenth year should attend an adjoining high school to take work of the eleventh and twelfth years. The *Cardinal Principles* contain the following reference to the 6-4 type: "In sparsely settled communities where a senior high school cannot be maintained effectively, the junior high school may well be four years in length, so that the pupils may attend school nearer to their homes for one more year."[3]

Considerations which lead to the adoption of the 6-4 plan.—The purpose to promote effective secondary-school reorganization in small districts is the result both of deliberate plan and more particularly of recent growth of high-school enrollment. Many small schools find themselves forced, by reason of the exclusion of their high-school pupils from congested four-year high schools, to provide their own secondary-school facilities.

In most cases of high-school congestion the larger schools, when relieved of the ninth- and tenth-year non-resident pupils, can accommodate eleventh- and twelfth-year non-resident pupils. In a few cases the larger high school cannot accommodate even the eleventh- and twelfth-year non-residents. Consequently, many districts are confronted with new conditions which force the adoption of plans to provide in part or in whole for their own high-school pupils.

It is important that plans of school administration on the junior high-school basis be coordinated between adjoining districts both large and small. If the small district is to remain coordinated with the large district, as has been the universal practice heretofore, the types of school administration must continue to conform.

When, therefore, city, borough, village, or town systems are converted upon the 6-3-3 or 6-6 plan, smaller systems which adjoin them are also confronted with the problem of coordinating their courses of study with the reorganized program of studies in the larger systems. The present complexity of conditions which large systems must face in administering their own ninth- and tenth-year pupils who are trained in junior high-school work with ninth- and tenth-year non-residents who are not so trained is likely to grow still more complex until either large high schools must exclude all ninth- and tenth-year non-residents or until smaller systems coordinate their courses with the reorganized courses of the larger systems. The development of the 6-4 and 6-3 types as described later, must, therefore, be concurrent with the expansion of the 6-3-3 and 6-6 types of school administration.

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[3] Ibid., p. 19.

The situation is bringing about a general tendency to adopt a four-year junior high school in the smaller community. Conformity of school administration is thereby established between large and small districts. Coordination of courses of study is promoted. The condition of high-school congestion is relieved. The burden of meeting steadily increasing costs of tuition is materially lightened for the small districts. And what is of chief importance? Equal secondary school advantages are brought within the reach of all children irrespective of the accident of residence in a large or small school district.

Minimum essentials for four-year junior high school.—In the organization of a four-year junior high school, a distinct program of studies should be adopted for Grades VII, VIII, and IX. A suggested program of studies will be found on a following page. Since pupils who complete a four-year junior high school will enter a neighboring high school for the eleventh- and twelfth-year work, the tenth-year curriculum should be closely coordinated with the tenth-year curriculum of the larger high school.

The elementary courses of study in Grades VII and VIII and the secondary courses in the ninth year which prevail prior to the organization of a four-year junior high school should undergo the same changes to the junior high-school basis which occur when a 6-3-3 or 6-6 plan is adopted. These changes briefly are as follows:

1. Composite English should include reading, literature, composition, grammar, spelling, and penmanship.

2. General mathematics should replace exclusive courses in arithmetic in Grades VII and VIII and algebra should largely comprise the ninth-year course.

3. Social studies should comprise courses in United States, history, geography, community civics, and vocational and economic civics.

4. Science should extend over the seventh year, half of the eighth year, and the whole of the ninth year.

5. Health education should include hygiene courses and gymnasium or playground work in physical training.

6. Practical arts should comprise shopwork for boys, preferably general shop in place of manual training, and courses in sewing, cooking, and home training for girls.

7. Fine arts should include art or drawing and music with opportunities for club electives in both on part of pupils who wish to specialize in fine arts.

8. School activities and guidance programs should be administered in conformity with suggestions in chapter VIII.

9. Electives to the extent of at least two should be offered, that is, foreign languages, commercial courses, practical arts, or agriculture.

This basic reorganization of the program of studies involves corresponding changes in building facilities, faculty organization, and school administration. The junior high-school program of studies in 6-6, and 6-4 systems is given here.

SEVENTH YEAR

Subjects	Periods a Week
English	5
General mathematics	5
Social studies:	
U. S. history	4
Geography	3
Science	2
Health	3
Practical arts:	
Girls sewing	1
Girls cooking	1
or	
Boys industrial arts	2
Fine arts:	
Art	1
Music	1
Activities:	
Auditorium	1
Home-room period	1
Clubs	1
Guidance	1
Total	30

EIGHTH YEAR

English and Latin	5
General mathematics	5
Social studies:	
Community civics	4
Science	2
Health	3
Practical arts:	
Girls sewing	1
Girls cooking	1
or	
Boys industrial arts	2
Fine arts:	
Art	1
Music	1
Activities:	
Auditorium	1
Home-room period	1
Clubs	1
Guidance:	
Junior business training (first semester)	1
Electives (second semester):	
Junior business training, foreign language or practical arts, or fine arts	3
Total	30

NINTH YEAR

English	4
Algebra	4
Social studies:	
Vocational civics (½ year) Economic civics (½ year)	4
General science	4
Health	2
Practical arts:	
Girls sewing	1
Girls cooking	1
or	
Boys industrial arts	2
Fine arts:	
Art	1
Music	1
Activities:	
Auditorium	1
Home-room period	1
Clubs	1
Guidance	1
Electives:	
Commercial, foreign language, practical arts or fine arts	4
Total	30

It is recommended that junior business training be required of all pupils for the first semester of the eighth year and that electives be first offered in the second semester of the eighth year. It will be noted that a core curriculum of constants is required for all pupils for three semesters, that is, the first and second semesters of the seventh year and the first semester of the eighth year. It will also be noted that electives are offered for the last three semesters. At no time in the junior high school is the core curriculum reduced to less than five-sixths of the school week.

Room and equipment facilities should be provided for science, industrial arts, cooking and sewing, gymnasium, library, and commercial education if the latter is offered as an elective. There should be an auditorium large enough to seat the entire pupil body. The auditorium may be a separate unit, part of a combined auditorium-gymnasium, or two or more communicating rooms capable of being used as an auditorium. In most three-year high schools, building changes must be made for approximately all the activities which are listed with the possible exceptions of a science room and a library. A new building constructed for a four-year junior high school should contain all the facilities listed.

The teaching of all subjects by one grade teacher is replaced by departmental teaching. It is assumed that a schedule of classes which is the working plan of departmental administration will be made at least once a year. Teachers should undertake extramural and summer courses to prepare for teaching reorganized courses of study and to prepare also for administering socialized methods of instruction. All junior high-school teachers should take one or more courses in the principles of junior high-school education that they may more intelligently contribute to the realization of junior high-school objectives.

The administration of a four-year junior high school must be adjusted to the reorganized program of studies, the new building facilities, to changes in classroom instruction, and to characteristic features of junior high-school administration. The entire readjustment cannot be effected in the initial plan of organization. However, a progressive readjustment should be effected over a period of three years in order that school administration may continuously coincide with educational reorganization.

A common schedule of classes should be organized for all four years. This schedule will entail departmental instruction by each teacher in all four grades. The characteristic time schedule of all junior high schools, that is, six periods of one hour each, should prevail also in the four-year junior high schools.

SIX-THREE: THREE-YEAR JUNIOR HIGH SCHOOL

The 6-3 type comprises an elementary school of six years —either a one-room or a consolidated elementary school— and a three-year junior high of Grades VII, VIII, and IX. The elementary and junior high-school grades may be administered in separate buildings or in one common building.

Considerations which lead to the adoption of the 6-3 plan. —The same considerations which lead to the adoption of the four-year junior high school hold with equal or even greater effect in case of the adoption of the three-year junior high school of two or three teachers. The growth of high-school enrollment in four-year high schools frequently forces the larger school to eliminate ninth-year pupils. If this larger system is organized upon the 6-3 or 6-6 basis, it will be advisable for the smaller system, when obliged to provide for its own ninth-year pupils, to conform to the organization of the system to which its ninth-year graduates will be sent to complete their high-school course. The adoption of the three-year junior high school becomes, therefore, the logical solution of the problem which confronts the smaller district.

Any rural or township community which is thrown upon its own resources to provide partial high-school facilities for its ninth-year pupils should first adopt the three-year junior high school of two or three teachers in accordance with the following conditions. When the enrollment of Grades VII, VIII, and IX is less than ninety and more than fifty, a three-year junior high school of three teachers should be organized. When the enrollment is less than fifty a three-year junior high school of two teachers should be adopted. When the enrollment in a three-year junior high school of three teachers approximates or exceeds ninety pupils a fourth teacher should be provided. The organization should then be expanded to include the tenth year which changes the three-year organization into a four-year junior high school.

Not only does the adoption of the three-year junior high school solve the problem of providing high-school training for a district's own ninth-year pupils but it also provides more efficient administration of Grades VII and VIII and of the elementary school of Grades I to VI. In the case of Grades VII, VIII, and IX greater curriculum opportunities are possible when the three grades are organized into one unit. More efficient instruction is also possible in the departmentalized junior high school through the change from a heterogeneous teaching schedule to a homogeneous departmentalization.

Furthermore, the reciprocal gains to the elementary school, particularly the one-teacher elementary school, are of equal importance by reason of the fact that the elementary school is reduced to the more efficient basis of six grades. The elementary-school teacher is relieved of teaching Grades VII and VIII and can concentrate with greater effect upon the instruction of Grades I to VI.

Minimum essentials for a three-year junior high school. —The full program of studies which is recommended for 6-3-3, 6-6, and 6-4 systems cannot be administered in a three-year junior high school of two or three teachers. The following adaptations of the complete program of studies are recommended for three-year junior high schools. In the case of a three-teacher school it is not likely that instruction by trained teachers can be given in fine arts—drawing or music—in practical arts—shops, cooking and sewing—or that electives can be offered in foreign languages or commercial courses. A core curriculum must in most cases be required of all pupils in Grades VII, VIII, and IX. The program of studies should include briefly the following when there are three teachers:

1. English—Reading, literature, composition, and grammar, five periods a week of an hour in each grade
2. Spelling and penmanship—In Grades VII and VIII, two periods a week equally divided between the two subjects

3. Social studies—United States history, seventh year; community civics, eighth year; vocational and economic civics, ninth year; each five periods a week of an hour each
4. General mathematics—Five periods a week in each grade; gradually introduced as suggested in the complete program of studies for 6-3-3, 6-6, and 6-4 systems
5. Geography—Four and three periods a week respectively in Grades VII and VIII
6. Science—In the eighth year to the extent of two periods; general science in the ninth year for five periods
7. Agriculture—A substitution in place of industrial arts for boys, two periods a week
8. Home economics for girls—Home projects in sewing and cooking for which work girls should be excused two periods a week for an hour each when project work at home will be undertaken
9. Health instruction—Two periods a week; in lieu of gymnasium, out-door games should be played when weather conditions permit
10. Guidance—Given by the principal or head teacher to seventh and eighth grades
11. Activities—Home-room period once a week and an assembly or club period (alternating) once a week; chorus singing in the assembly program
12. Study periods—Necessary in a three-teacher organization to the extent of two in Grade VII, one in Grade VIII, and four in Grade IX

This program can be enriched by drawing, music, practical arts, or electives. The study periods may be omitted, provided classes are combined or subjects are alternated, and provided part-time instructors are employed. A partial program of studies for a three-teacher junior high school of the 6-3 type is given:

SEVENTH YEAR

Subjects	Periods a Week
English	5
Spelling and penmanship	2
Social studies	5
Mathematics	5
Geography	4
Agriculture and home projects or Sewing and home projects	2
Health	2
Guidance	1
Activities	2
Study	2
Total	30

EIGHTH YEAR

English	5
Spelling and penmanship	2
Social studies	5
Mathematics	5
Geography	3
Science	2
Agriculture and home projects or Sewing and home projects	2
Health	2
Guidance	1
Activities	2
Study	1
Total	30

NINTH YEAR

English	5
Social studies	5
Mathematics	5
General science	5
Agriculture and home projects or Sewing and home projects	2
Health	2
Activities	2
Study	4
Total	30

In the case of two teachers the program should include:

1. English, mathematics, geography, science, and activities—Same periods a week as in the case of three teachers
2. Social studies—Reduced from five periods a week to four periods a week
3. Spelling—A part of composite English
4. Penmanship—An hour a week divided into two thirty-minute periods and alternating with half-hour study periods
5. Guidance periods—Omitted; guidance instruction made part of home-room and assembly programs
6. Health instruction—Omitted except so far as it can be made part of the science work
7. Fine or practical arts—No instruction; chorus singing may be made part of the assembly program. Project work may be given in shop, agriculture, or home economics although two teachers can spare little time to supervise the home projects
8. Study periods—Increased for each grade; nine periods in Grade VII, ten periods in Grade VIII, and nine periods in Grade IX.

The possible combination of classes and alternation of subjects will remove some of the limitations placed upon the program of studies in a two-teacher organization. Caution should be observed, however, against multiplying the number of subjects which each of the two teachers must carry. A few subjects taught effectively will supersede, in actual educational returns to pupils, many subjects taught ineffectively. Primary concern in both two-teacher and three-teacher organizations should be given to a thorough preparation of pupils of Grades VII, VIII, and IX in a few subjects which they most need or which they are required to offer for admission to the tenth year of an adjoining senior high school. Consequently, the tendency should be avoided to multiply subjects in small organizations to the detriment of essential courses of study. The following is a partial program of studies for a two-teacher junior high school for the 6-3 type:

Seventh Year

Subjects	Periods a Week
English	5
Mathematics	5
Social studies	4
Geography	4
Penmanship	1
Activities and guidance	2
Study	9
Total	30

Eighth Year

English	5
Mathematics	5
Social studies	4
Geography (½ year)	
Science (½ year)	3
Penmanship	1
Activities and guidance	2
Study	10
Total	30

Ninth Year

English	5
Mathematics	5
Social studies	4
General science	5
Activities and guidance	2
Study	9
Total	30

No building changes are necessitated by the partial program of studies for three-year junior high schools of three or two teachers. As the program of studies is gradually worked out and as the number of pupils increases building changes may be effected. The building requirements of a four-year junior high school may thus be gradually fulfilled. The necessity to provide for the ninth-year pupils who are eliminated by reason of congestion in adjoining high schools must first be met by a partial program of studies adaptable to present building conditions. The practicability of the program of studies will be demonstrated by the faculty organization for a three-year junior high school of three teachers.

TEACHER A
(Principal)

Subjects	Periods a Week
Mathematics	15
Agriculture and home projects	6
Guidance	2
Activities	2
Supervision	5
Total	30

TEACHER B

English	15
Penmanship and spelling	4
Geography	7
Health	2
Activities	2
Total	30

TEACHER C

Social studies	15
Sewing and home projects	6
Science	7
Activities	2
Total	30

The faculty organization for a three-year junior high school of two teachers is also given:

TEACHER A

Subjects	Periods a Week
English	15
Social studies	12
Penmanship	1
Activities	2
Total	30

TEACHER B

Mathematics	15
Geography and science	12
Penmanship	1
Activities	2
Total	30

Adaptations of the administrative features of a junior high school are practicable in a two-teacher or three-teacher organization. Each three-year junior high school should be administered in anticipation of its development as a four-year organization. Progress to this end must be gradual. It is advisable, therefore, that administrative features of the junior high-school movement be adapted so far as practicable to small school conditions.

In the case of three-teacher organizations the study periods are not numerous enough to cause particular difficulty. However, in the case of two-teacher organizations the study periods must be under the direction of pupil officers or distributed to the two teachers. In the latter case there will be under one teacher's charge one class in classwork and a second class in a study period or the class in study period may be divided between the two teachers. By combining classes for classwork some of the study periods may be avoided.

THE CASE OF THE INTERMEDIATE GRADES

FANNIE DUNN
Teachers College, Columbia University

The intermediate grades have for many years been the only important competitor of the rural schools for the position of the Cinderella of American education. The first important development in our public-school system was the grammar school. Later the primary department or infant school was added, replacing the old dame schools. The leadership of Pestalozzi and especially of Froebel tended to develop appreciation and respect for the primary grades, replacing the old idea that anyone could teach a young child with a realization that the task was one of dignity and importance. The child-study movement was probably the most conspicuous feature of educational progress some forty years ago. Special training was recognized as of great importance for primary grades.

Meanwhile, there was a large majority of untrained teachers in our teaching force. The upper grades were deemed too difficult as to subject-matter for the less able teacher, the primary grades were to some extent protected by their need for special "method." As a result, the intermediate grades have quite generally had more than their proportionate number of under-trained, inexperienced, or otherwise less able teachers. Indeed, this has frequently been stated as a desirable policy in teacher placement.

There has also for some reason grown up a widespread belief that the intermediate grades are preëminently the place for more or less abstract drill. This may be due to the fact that less able teachers can conduct drill lessons more effectively than lessons of any other type. More probably it is to be traced to an adequate conception of the psychology of these grades combined with a faulty philosophy of education. A few psychologists have insisted that the years from ten to thirteen are the most important for memorizing, this period indeed having been called the "golden age of memory." It is true that verbal learning is comparatively easy for children at about this age, and the power of immediate memory increases more during that period than any other equivalent period. This power, however, continues to increase at least up to the age of fourteen or fifteen, and evidence is adduced to show it increases even into the early twenties. Adults can memorize better than children. If you do not believe this, set yourself and a fourth-grade child the same memory task and see which completes it first.

The adult's memory, however, is of a more logical type than the child's, and, according to Norsworthy and Whitley, "it seems almost impossible for an adult to hold in memory a fact when there is not much to hang it to, no relationships or reasons that will serve as cues, whereas such facts seem simply to stick in the mind of most children." It is also true that what a child does not forget he retains longer than an adult. "A child of ten would not learn so easily as an adult of thirty for an immediate test of memory, would forget more during the first twenty minutes following the memorizing, but would keep better to the next day or the next week whatever survived the first forgetting period."

The conclusion which these authors draw is that when isolated facts are sufficiently important to be permanently in mind, childhood is the time to fix them. In this statement the first clause "when isolated facts are sufficiently important to be permanently fixed," needs to be given equal weight with the second, "childhood is the time to fix them." This is a different matter than the assumption that these years are predominantly to be devoted to drill. Leading educational thinkers today are questioning whether there are many isolated facts worth fixing permanently. Most facts worth knowing are bound up with associations of many kinds, which make them subject to logical rather than mere "brute" memory. Moreover, the storage concept of education, characteristic of an educational philosophy which made knowledge its chief end, has given way to a dynamic ideal, which aims at facilitation of growth processes and values the ability to attack new and unusual situations more than any accumulation, however, extensive, of mere facts. Knowledge is deemed of worth only to the extent to which it is usable and used, and the acquiring of knowledge in relation to problems is believed to be essential to its later application in meeting the needs of life.

With this as our educational objective, we need to scrutinize anew the qualities of the intermediate-grade child. Are there elements in his nature, overlooked or suppressed under older educational ideals, which afford material for development in harmony with modern educational philosophy? Has the intermediate-grade child any notable potentialities except in the memory field? Can a child of this age think? Is he capable of abstraction and generalization? It is a serious error to conceive of thinking as beginning sharply at any period of life, as springing for the full-fledged, as it were, at, say, the beginning of adolescence. Indeed, practically as soon as a child is able, through language, to reveal to us the nature of his mental processes, we find him thinking. A child of my acquaintance, less than two years of age, was fond of walking to a nearby stream called Buffalo Creek or more frequently just Buffalo, and of throwing stones in the water for the sake of the loud splash which they made. Someone presented her with a set of blocks covered with pictures of animals. With the inquiring disposition which was already a characteristic of hers, entirely normal at her age, she would point to one after another of the animals and ask, "What's dat?" When one such question brought the answer, "a buffalo," she was very evidently nonplussed. There was in this object nothing visible of the characteristics of the "Buffalo" she knew. She reacted to the puzzling situation in various random ways, one of which happened to consist of pounding two blocks together, one held in each hand. At the clashing sound this produced her face lighted up brilliantly and she exclaimed, with every evidence of delight in a problem solved, "Buffalo, splash! Buffalo, splash!" In the sound she had found an element of commonness, sufficient to enable her to include the two very diverse objects under a single category, buffalo. Here was a problem, search for suggestions, analysis, and abstraction. The conclusion was incorrect, due, not to the quality of her thinking process, but to the limitations of her experience.

The thinking process begun in early childhood, normally continues through life. It occurs when a problem, a discrepancy, a disharmony, an unreconciled fact arises to stimulate it. Children who do not encounter many such "forked road" situations will think less than those who do. Children whose range of experience, and hence of suggestions and criteria, is limited, will think less effectively than those who are better provided. The problems about which they think may be of little worth from an adult point of view; indeed, to the unsympathetic adult their solutions may be so obvious that they do not appear to be problems at all. The essential matter is that to the child himself they shall be real and vital and that under their compulsion he shall go out in search of material for their solution, shall analyze, abstract, and systematize it.

A very serious danger that threatens the child's growth in thinking is his limited power of concentrated attention. A problem has to be very compelling, if its solution is fairly remote, in order to hold him till he reaches a satisfactory solution. This difficulty is further complicated by his uncritical nature. He tends to accept a superficial explanation rather than test and verify until he reaches a conclusion that is sound. This tendency, unfortunately, is strengthened by the type of reply he often gets from the adult to whom he has turned for help in solving his problem. The adult himself shrinks from the extended analysis necessary to reconcile some of the facts which the child is attempting to reduce to coherence and order, and either gives a spurious solution or definitely suppresses inquiry.

It should be evident from these premises that the capacity for thinking, as well as for memorizing, is already present in the intermediate-grade pupil. The task of the school is so to graduate the difficulty and extent of the problems which he is led to encounter that his power of attention will be capable of following them to successful solution, and to reinforce the initial drive of the problem, if necessary, along the road to its satisfactory conclusion. If concentrated application is to become habitual, it must provide the satisfaction which success alone can bring.

It is true that the younger pupils do not think as much as the older ones. Their instructive reaching out for enlargement or enriching of personality is not always or perhaps not often of a problem-solving nature. They are hungry for experiences, to see, to touch, to taste, to handle, and to do something to discover what will happen. All this is as far from the realm of verbal memorizing as is true thinking. It is concrete, vivid, rich in associations, rather than isolated, abstract, and deficient in meaning. It may seem to the adult to consist of unrelated items, but these are probably filling out a system in the child's mind, if it be only a systematic series. The child who asks "What's this? What's that?" is gradually becoming introduced to all the objects of his environment. Later he will ask, "What is it for?" and, "How does it work?" Still later his questions will be predominantly, "Why?"

Over a number of years during which I was in charge of third and fourth grades in a certain school, it was my observation that the third-grade children's questions were generally of the what and how types." The fourth grade continued the how questions, and also seemed almost to burst into why's. The observations I am reporting were merely casual. I know of no scientific study in this line. I wish I did. In my judgment we need many such studies before we shall be in a position to do justice to the intermediate-grade pupil's potentialities for education. I have often had my judgment challenged by other teachers, who maintained that the qualities I had found characteristic of third-grade pupils until about mid-year, namely, a strong tendency to imitativeness, to a following of any leader, like a little flock of sheep going over a fence, were those which in their observation were true of the fourth grade. It may be that the average age of their fourth grades and mine may have differed enough to account for our disagreement, but I am inclined to believe that another factor was influential. In our school there was a strong nature-study course. From the first grade the children had had a rich experience of guided observation in the natural aspects of their environment. There was also, beginning with the first grade, an unusually good course in social studies. These children, therefore, had already accumulated a large number of definite concepts and ideas by the time they had reached the fourth grade. They had been led to think about simple questions dealing with the objects of interests all about them. It would have been astonishing if this early development had not borne the fruit which it did by the time the fourth grade was reached. I remember a boy in that grade who was reading with his class the story of Noah and the Flood. He had studied the primitive life series by Dopp, and he had visited museums where huge skeletons of prehistoric animals were displayed. He balked at the statement that a pair of each kind of animal on the earth was taken into the ark. "That couldn't be so," he exclaimed. "They must have written that down wrong." A visitor in the classroom remarked that it was the most juvenile case of Biblical criticism that had come to his attention. I remember also many a lesson in geography or astronomy I conducted with that grade when the why questions I was about to ask were taken out of my mouth by the eager children whose thoughts were running ahead faster than I could call them out.

It is not in the realm of thinking alone that potentialities exist at this period. I have already referred to the zest with which concrete observations are made and the individual horizon is extended to encompass the many items of the environment. Yet these observations, delightful and enjoyable though they prove to be, are not necessarily, I believe not even probably, made without a teacher's guidance. Some strong or vivid stimulus is required to call the attention from the already familiar aspects and the total situation, and focus it upon some previously unnoticed feature. Moreover, the attention turned to an object is not necessarily investigative. It needs to be directed into lines of purposive inquiry. Whether the environment is to be intelligently perceived and its vital relationships discovered is largely dependent upon the type of interest which the teacher is able to arouse.

Still another outstanding characteristic of pupils of intermediate-grade age is the tendency to construct. This tendency expresses itself both mentally and physically. The child dramatizes life situations from his environment. He recombines elements of many situations—home activities, observations of occupations about him, characters and events of his reading, all weave themselves together in a mental construct. Girls carry on animated conversations for their dolls, boys play Indians or robbers or Robin Hood, the range and richness of their play being determined by the range of their experiences. Their creations may be manual rather than mental. They construct doll clothes, doll houses, furniture, playhouses, wagons, sleds, farms, railroads, ships and waterways, dams, and a multitude of other objects for which suggestions are found in their experience. Under guidance, the constructive urge may be utilized to promote closer observation and to develop standards of performance suitable to the child's growing abilities. Creative imagination, design, practical skills, and habits and attitudes of self-activity to achieve desirable ends, are outcomes of the constructive tendencies of children which have been afforded opportunity and guidance for development.

The intermediate-grade period may be made to yield a body of verbally memorized, but little understood and less, used facts, which, if not forgotten, may some day be employed to solve a crossword puzzle if for nothing else. The same period may produce a rich range of perceptions and concepts, a beginning association of these into systems of meaning, a partial control of method of inquiry and thought, numerous interests to serve as motives for further development, abilities to create ways and means of realizing desires or expressing ideas, and along with these such items of knowledge or skill as have already proved themselves of value in carrying out purposes normal and vital to the learner's stage of development. Whether all the minimal essentials of knowledge and skill needed in life may be acquired functionally, in relation to the learners present needs, by the time he has completed the compulsory education period, we do not yet know. Many claim that they may. Certainly until we have thoroughly tried out ways and means of getting these along with rich growth and productive present living we cannot afford to deny the possibility. Even if we were experimentally to determine that the two could not be had together, we might wish to ask which of them were the true "minimal essentials." Is it more important to punctuate the heading of a letter correctly or to write so as really to share an experience with a friend or relative in a distant state? Is correct spelling more worth while than ability to get sheer joy out of a poem or a song sparrow? Is a knowledge of dates of past events to be compared with intelligent interest in the life going on about one today?

I have said we can get either one set of outcomes or another, but I am not sure of my statement. We have to take into account the will of the pupil. According to Judd, pupils fail of promotion more in the fourth or fifth grades than in the second, third, or sixth, and leave school in large numbers in the fifth and sixth grades. Either we are asking an impossibility of many or the tasks we set for them and the type of teachers we provide in these grades do not enlist interest and application sufficient to achieve the ends we have set up. Probably the results are due to a number of factors. Undoubtedly we have provided for the satisfaction of only a small part of the intermediate-grade child's native tendencies in a curriculum which puts its main emphasis upon drill. My observation leads me to the belief that in respect to teaching materials, especially textbooks, these grades are inadequately supplied. Intermediate histories are usually much too difficult; intermediate geographies until recently have been meager, skeletonized outlines of the fuller material provided in upper grades; and even now the improved texts are being taught as if they were mere collections of isolated facts. Intermediate readers are much better today than they were ten years ago, and modern ideas of teaching reading are better suited to the nature and needs of intermediate grade pupils than were the oral reading methods of the past, but comparatively few intermediate teachers are qualified to employ the newer methods.

In order to realize fully the potentialities of intermediate-grade pupils, much research and constructive work is needed. It is possible, however, to take at once two important steps which will go far toward making this research and constructive work possible. One of these is to express the desired outcome of these grades in terms of growth—mental, moral, physical—including attitudes as well as knowledge and skill, and providing for health, leisure, citizenship, and practical efficiency that shall include more than mere facility with abstract facts or skills. The other, which is fundamental to the whole program, is to supply for these grades teachers of as high quality in education, professional training, experience, and personality, as those supplied for primary grades or junior high school.